# MacWEEK

04.05.93 Volume 7 Number 14 THE NEWSWEEKLY FOR MACINTOSH MANAGERS


**In Reviews**

**SpreadBase**
Good data-analysis tool held back by performance

**Turbo 3D**
Speed has a price in solid modeler and renderer

**Multi-Ad Creator**
The perfect tool for a specific end: creating ads

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## Sun OS set to shine on PowerPC, let future Macs run Windows apps

**By Henry Norr**

Mountain View, Calif. — Buying Apple hardware has always implied choosing the company's operating system and the applications designed for it, but that may change next year when the Mac begins moving to the PowerPC platform.

SunSoft Inc., software subsidiary of Sun Microsystems Inc., last week said it expects to release a version of its Unix-based Solaris OS for the new Apple-IBM-Motorola RISC processor sometime next year. The move will apparently make Sun, based here, the first company to offer a full-blown alternative operating environment for Apple computers.

Apple spokeswoman Betty Taylor called the announcement "good news."

"We're pleased to have Sun's support for the PowerPC architecture," she said. "It's further evidence that PowerPC is going to be a winner."

Sun's endorsement could be an important step toward making the PowerPC a true industry standard. Scott McNealy, the workstation maker's outspoken CEO, has often said that Sun would bet on only three processor architectures to

*See PowerPC, Page 120*

## QT, CD play at intermedia

*New Apple speakers cause buzz at show*

**By Neil McManus and Kirsten L. Parkinson**

San Jose, Calif. — QuickTime passed the 1 million-shipped mark last week, and Apple and other companies rallied to proclaim that multimedia is reaching critical mass.

Attendees of intermedia, a multimedia and CD-ROM conference and exhibition here last week, got an eyeful of the present and future of multimedia technology.

More than 225 companies demonstrated hardware and software CD-ROM and multimedia tools while industry pundits grappled with where multimedia is headed.

Highlights included:

▶ **Apple speakers.** Apple spoke up on the subject of sound, introducing the $179 AppleDesign Powered Speakers. The speakers, shipping now, include two input jacks that let users connect them to a CD-ROM drive, CD player or television, as well as their Mac.

The speakers incorporate a mixer, allowing users to hear Mac sounds and CD output simultaneously. They also include an amplifier, balance controls and a headphone jack.

Apple showcased its new PowerCD, a portable device that plays CD-ROMs, Photo CDs and audio CDs. The company said the drive

*See intermedia, Page 119*


Research Report

MacWEEK 1993 Networking Study

Scoping out the forces that shape Mac networks

See Page 22


NEWSPAPER SECOND CLASS

## Apple USA beefs up support, repair plans

*On-site service, toll-free tech line*

**By Jon Swartz**

Campbell, Calif. — Apple USA this week will announce Apple Assurance, a far-reaching warranty plan that offers Mac users free one-year repair service and toll-free technical support.

▶ **Repairs.** For products purchased after Feb. 1, Apple's one-year warranty will include three new service options. Apple technicians or Apple Authorized Service Providers will offer on-site repairs, air carrier pickup and delivery of products needing repairs, and carry-in repair service.

The warranty will be good worldwide. Regardless of where they bought their Mac, users can have it serviced at AASP sites anywhere.

Apple is signing up resellers to provide support. AASPs will be responsible for all service and support within a 60-mile radius and will be reimbursed $60 per repair by Apple, according to dealers.

Modeled after multitiered support programs already offered by IBM Corp., Compaq Computer Corp., Dell Computer Corp. and others, the plan aims for four-hour response time and 48-hour turnaround on repairs.

Owners of selected lower-cost peripherals, such as Apple's StyleWriter and OneScanner, will have the option of immediately swapping

*See Warranty, Page 120*

**Apple Assurance program**

- All desktop Macs sold after Feb. 1 receive free one-year service, either on-site, mail-in or carry-in.
- Service-authorized resellers provide two-day turnaround on repairs for users within a 60-mile radius.
- Toll-free telephone customer support is immediately available for all products at (800) 767-2775.
- Users of some lower-cost Apple peripherals can swap defective products for replacement units at authorized resellers.

## AppleScript Toolkit, runtime version will ship this month

**By Raines Cohen**

San Francisco — AppleScript, Apple's long-awaited scripting technology, will ship in the next two weeks, the company said last week.

The software, which will make its official debut at this week's Apple Enterprise Computing Conference here, will offer a systemwide object-oriented language that can be used to automate tasks within an application or across applications.

Initially a System 7 extension, AppleScript will eventually be incorporated into the Mac operating system. According to Apple, the language will lay the groundwork for future technologies, including voice control and intelligent agents.

AppleScript's power comes from letting scripts reach into applications to manipulate their internal data. However, only the dozen or so applications specifically written to be scriptable, including Claris Corp.'s FileMaker Pro 2.0 and Microsoft Excel 4.0, can be controlled. Apple officials said they expect 30 to 50 applications will be scriptable by this

*See AppleScript, Page 119*

## Euro developers headed for U.S.

**By Andrew Gore**

Paris — Mac developers in Europe are showing a new boldness about bringing their applications to the U.S. market.

The Macintosh has carved out a significant niche in enterprise computing on the continent, industry observers here said. But developers here, citing the high cost of localization and marketing as the main barriers to entry, have been wary about crossing the Atlantic.

In light of the growing acceptance of the Mac as an enterprise solution in the United States, however, many European developers are now making plans to offer their products to U.S. customers.




**ArchIS File allows users to store terabytes of Macintosh graphics, QuickTime movies, text and binary files on a server. Files can be recalled by keyword searches, displayed as thumbnails, edited, printed or exported.**

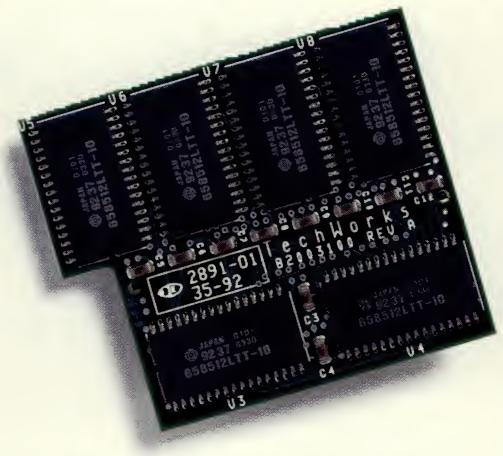
Among European products already available in English-language versions are:

▶ **ArchIS.** SoftCore N.V. offers a pair of products, ArchIS File and ArchIS Documentation, designed for storing and accessing the huge volume of documents and graphics used by today's multinational companies. Unlike products such as Aldus Corp.'s Fetch or Canto Software GmbH's Cumulus, which are intended specifically for graphics, the SoftCore system offers electronic management of files in any format.

ArchIS File allows users to store documents within a hierarchical

*See Europe, Page 119*

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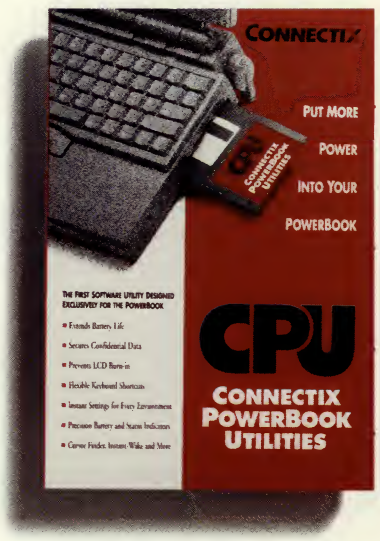

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## TECHWORKS™

# New configurations to join Performa line next week

*Models are based on LC II, LC III*

**By Lisa Picarille**

Cupertino, Calif. — Apple will add three more models to its consumer Performa line next week, sources said.

The company reportedly will offer two configurations based on an LC II and one based on an LC III. The new models are:

- **Performa 405.** Based on the LC II with its 16-MHz 68030 processor, this $1,349 model will come with 4 Mbytes of RAM, expandable to 10 Mbytes; an 80-Mbyte hard drive; and a 14-inch color monitor.
- **Performa 430.** This model has the same features as the Performa 405 but will come with a 120-Mbyte hard drive. It will be priced at $1,499.
- **Performa 450.** Based on the LC III, this model will come with a 25-MHz '030 processor; 4 Mbytes of RAM, expandable to 36 Mbytes; a 120-Mbyte hard drive; and a 14-inch color monitor. It will be priced at $1,899.

All the new Performas will come with an external 2,400-bps modem with 9,600-bps send-only fax capabilities.

All offer on-board support for 8-bit color on their 640-by-480-pixel displays, a processor direct slot and a sound input port with microphone.

The models will be bundled with software, which will vary for different types of retail outlets.

Versions sold at consumer-electronics stores will come with ClarisWorks, CheckFree Corp.'s CheckFree, Apple's Macintosh PC Exchange and At Ease, and assorted games and utilities.

Apple introduced the Performa line in September 1992. The existing models include the Performa 200 and 400, which are relabeled versions of the Mac Classic II and LC II, and the Performa 600 and 600 CD, based on the Mac IIvx.

The systems, aimed at the consumer, home-office and small-business portions of the market, are sold through consumer electronics, general merchandise and office-products superstore chains. □

# Apple tools up diagnostic offerings

*Technician packages now available to users*

**By Robert Hess**

Cupertino, Calif. — Apple is now offering a slew of Mac diagnostic tools previously available only to authorized technicians.

The tools, intended to help users diagnose but not fix problems with Macs and peripherals, are available as part of Apple's new Service Tools Marketing Promotion. They include:

- **Apple TechStep.** A 2-pound handheld device, the $995 TechStep hooks to a Mac to diagnose hardware problems on even nonfunctioning equipment (see MacWEEK, Dec. 3, 1991). It can be set to monitor CPU performance continuously to capture intermittent problems.

TechStep is configured to test all Apple SCSI drives as well as the Mac II, IIx, IIcx, SE, SE/30 and Classic. Two slide-in ROM packs, priced at $199 each, allow the unit to check additional CPUs. One ROM pack is designed for the Mac LC, LC II, Classic II, and Performa 200 and 400; the other is for the Mac IIci, IIsi, IIvx, IIvi and Performa 600.

Apple did not indicate when it might offer ROM packs to test other CPUs, such as the Quadra, Centris and PowerBook lines.

- **MacTest Pro.** Apple's diagnostic software package runs a variety of tests; provides configuration information; and checks for potential software-based problems, such as multiple System folders (see MacWEEK, June 8, 1992).

The software comes in three versions: One package, priced at $99, tests most CPUs and peripherals, including floppy drives, hard drives and modems; two other versions, one for the PowerBook and Duo lines and one for Quadra and Centris models, are $89 each.

- **Apple Service Guides.** Apple is offering two reference books for $45 each. The Networking and Communications guide provides recommendations and general information about Apple networking software, such as AppleShare 3.0, AppleTalk Remote Access and System 7, as well as specifications for Apple networking hardware.

The Peripherals Interface Guide provides information on pin-outs, cabling requirements and other characteristics of most Apple peripherals.

The tools are available only to buyers in the United States. Users can call (800) 950-2442 to request information or place an order. □

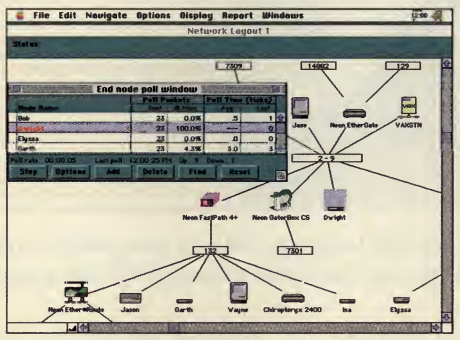

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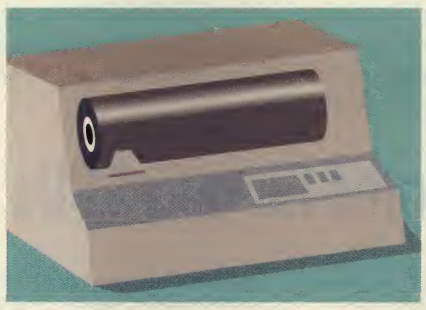
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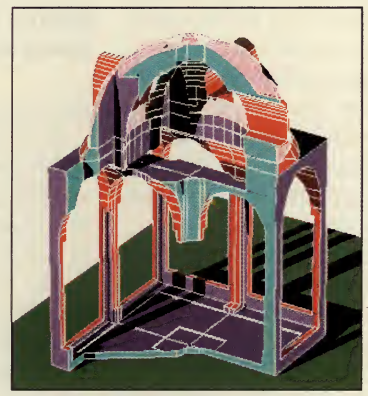
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# DynaText publishing to go Mac

## *Will build documents from SGML files*

**By Kirsten L. Parkinson**

Providence, R.I. — Electronic Book Technologies Inc. is preparing a Macintosh version of DynaText, its system allowing in-house publishers to create dynamic electronic documentation.

Due to debut at Seybold Seminars 93 in Boston this month and to ship in July, DynaText 2.0 will build complex electronic documents from files in Standard Generalized Markup Language (SGML) format, a standard endorsed by the Department of Defense and widely used in structured technical documents.

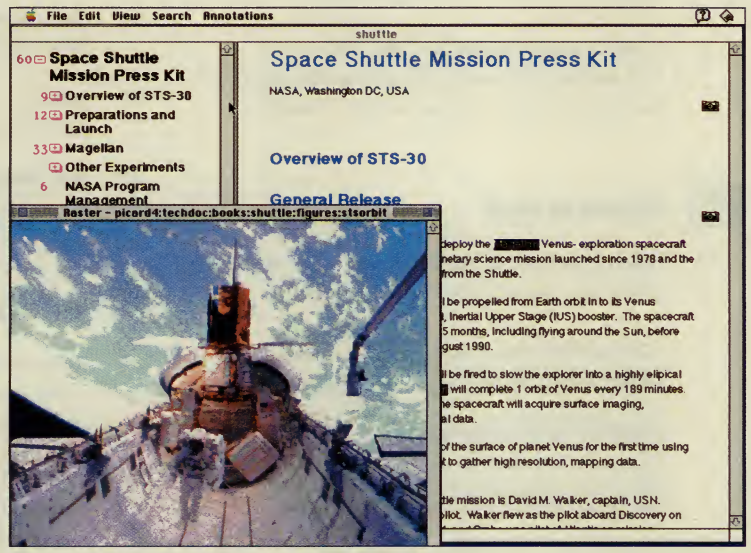
The program will include:

▶ **Indexer.** The indexer will take SGML files and automatically build a document; table of contents; index; and hypertext links to tables, illustrations and footnotes.

A style-sheet editor will let the publisher define text-formatting information as well as the behavior of hypertext links between text and other elements, such as artwork.

Publishers will be able to integrate artwork directly into the text view or create icons within the text that launch the related graphic when clicked.

▶ **Browser.** Users will be able to read and search DynaText documents with a separate browsing utility that will also let them add notations and bookmarks. It will be possible to use the browser as a stand-alone program or as a client application on a network.




**DynaText 2.0 from Electronic Book Technologies will let in-house publishers create dynamic documents with hypertext links. A table of contents (left) helps users navigate.**

The company already has indexers and browsers available on Windows and Unix platforms; a document created by any version of the indexer can be read by any version of the browser.

The browser will provide multiple views of a document simultaneously. For example, a publisher will be able to set up several views of the text in different languages.

Users will be able to navigate by clicking on the table of contents, which will expand to show section as well as chapter headings and will follow along as users scroll through the text. The browser will support full-text searching, and publishers will be able to create query templates to streamline complex searches, such as searching only chapter headings instead of full text for a particular word.

"Here at the university, we've used DynaText to create electronic books in the areas of literature, mathematics and science," said Paul Kahn, director of the Institute for Research in Information and Scholarship at Brown University here. "It combines many of the best features of hypertext technology and full-text searching in one product, and having it run across [several] platforms is a great advantage."

DynaText 2.0 will be available on a pay-as-you-go basis for $1,000 per title. The price includes a copy of the indexer and free read-only versions of the browser. Unlimited annual licenses will list for $150,000. A full version of the browser is $350.

Electronic Book Technologies Inc. is at 1 Richmond Square, Providence, R.I. 02906. Phone (401) 421-9550; fax (401) 421-9551. □

# HP ships LaserJet 4Si MX printer with 17-ppm output at 600 dpi

**By Matthew Rothenberg**

Cupertino, Calif. — Hewlett-Packard Co. this week shipped a speedy network laser printer that forges new connections for true 600-dpi output.

The LaserJet 4Si MX, which lists for $5,499, is based on a new Canon engine that can output 17 letter-size pages per minute. Like the company's 8-page-per-minute LaserJet 4M, the 4Si MX prints at a hardware resolution of 600 dpi, and it employs microfine toner that creates smaller, cleaner dots than earlier printer models. The 4Si MX also includes HP's Resolution Enhancement Technology software, which smooths rough edges on printed text and graphics.

The printer switches automatically between PostScript Level 2 and enhanced PCL 5, and it ships with 35 Type 1 and 10 TrueType fonts. It comes with LocalTalk and parallel interfaces, as well as HP's new JetDirect Ethernet interface card, which switches among 10 network protocols. Users can install an additional JetDirect card in a second modular input-output slot.

The 4Si MX runs on a 25-MHz Intel 80960CF RISC chip and ships with 10 Mbytes of RAM, which can be expanded to 26 Mbytes. It includes two 500-sheet input trays.

Hewlett-Packard Co. is at 19310 Pruneridge Ave., Cupertino, Calif. 95014. Phone (800) 752-0900. □



**The HP LaserJet 4Si MX comes with Adobe PostScript Level 2 and an Ethernet interface. It prints 17 pages per minute at a hardware resolution of 600 dpi.**

# Phoenix heats up driver race

**By Matthew Rothenberg**

Norwood, Mass. — Phoenix Technologies Ltd. next week will hit the road with a Mac driver for the Level 2 version of PhoenixPage, its PostScript interpreter.

The company will show the new driver at Seybold Seminars 93 in Boston and release it in June. Phoenix said the driver takes advantage of all Level 2 features, including compression and advanced color controls.

Apple and Adobe Systems Inc. will release their much-delayed Level 2 LaserWriter driver at Seybold (see MacWEEK, March 15).

Phoenix will demonstrate software algorithms that let PhoenixPage send rasterized images to the print engine in bands instead of downloading the entire image to a memory buffer. The company said the technology, called SoftBand, can reduce the memory requirements of 600-dpi Level 2-compatible printers by as much as two-thirds.

Phoenix OEMs include Xante Corp., Adaptec Inc., CalComp Inc., Lexmark International Inc., Seiko Instruments USA Inc. and Sharp Electronics Corp.

Phoenix Technologies Ltd. is at 846 University Ave., Norwood, Mass. 02062-3950. Phone (617) 551-4000; fax (617) 551-3750. □

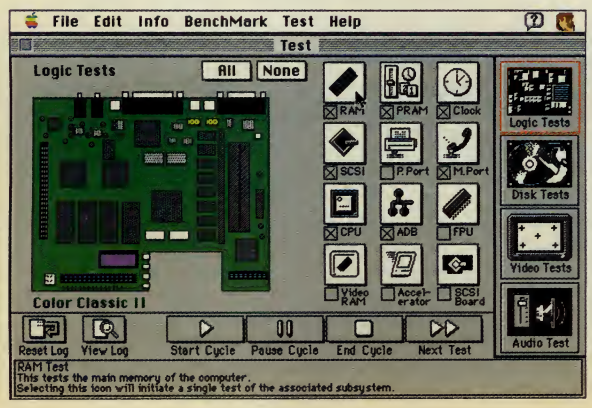
# Snooper diagnosis app updated for new CPUs

**By Raines Cohen**

Glendale, Calif. — Maxa Corp. last month shipped an update to its Macintosh CPU hardware-diagnosis application.

Snooper 2.0.4 supports the new systems Apple introduced last month: the PowerBook 165c, Color Classic, LC III, Quadra 800, and Centris 610 and 650.

Version 2.0 of the $249 application, announced last summer (see MacWEEK, Aug. 10, 1992), was initially slated to ship in October. However, Maxa said it delayed shipment to incorporate tests for third-party products. Version 2.0 shipped in January.




**Maxa's Snooper 2.0.4 includes maps of the logic boards of all Macs, including the recently introduced Color Classic.**

At start-up, Snooper determines which Mac it is running on and displays a representation of the system's logic board. A user can obtain detailed descriptions of the board's common trouble spots via on-line help.

Version 2.0 incorporates new routines for testing accelerators and video RAM and more-detailed RAM diagnostics that can pinpoint defective SIMMs. It also lets troubleshooters print out test results.

Upgrades from any earlier version are free. For an extra $100, Snooper is available with a NuBus board that can be connected to detect power supply, NuBus and Apple Desktop Bus problems in a machine being tested.

Maxa Corp. is at 116 Maryland Ave., Suite 100, Glendale, Calif. 91206. Phone (818) 543-1300; fax (818) 543-0104. □

# DigitalFilm gets bug-fix upgrade

Sunnyvale, Calif. — SuperMac Technology Inc. last week posted two pieces of news for its DigitalFilm video-production system: a bug-fix upgrade and an OEM deal.

▶ **Upgrade.** DigitalFilm 1.1 improves playback, color and audio quality, SuperMac said. The previous version had problems such as uneven audio-video lip synchronization, dropped frames during playback and system crashes during compression of noisy material (see MacWEEK, Feb. 8). The NuBus-based system still costs $5,999. Upgrades are free.

▶ **OEM deal.** Digital F/X Inc. of Mountain View, Calif., said it will use SuperMac's DigitalFilm technology as the hardware basis of its Hitchcock digital video-editing and authoring system. Hitchcock, due by May for $7,995, is the company's first all-digital video solution (see MacWEEK, March 1).

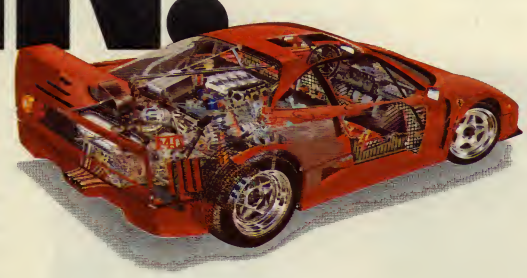
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Reporter's Notebook

# Germany's show of shows

## *PDAs grab limelight at mega-CeBIT '93*

**By Andrew Gore**

Hanover, Germany — What would you get if you crossed a three-ring circus with Times Square on New Year's Eve? Something that would still pale in comparison with the pandemonium and sheer bulk of humanity at *Die Mega Show*.

With 5,600 exhibitors from 46 countries occupying some 3.4 million square feet of floor space, CeBIT is the unsurpassed king of computer trade shows. Its 22 show halls were bursting at the seams with more than 600,000 attendees last month. Luckily, the show campus also had a shopping plaza, several eating establishments (including Germany's largest beer hall), its own train station, post office and a dozen banks.

When visitors got tired of eating and shopping, they could drop by Apple's bright sheet-metal booth with two lounges, dozens of displays and a dance theater.

Those who came by the booth at the suggestion of an Apple ad running in Der Spiegel magazine for a little hands-on with Newton were out of luck. Not only were there no demos, there wasn't even a Newton under glass, as seen at previous trade shows.

But the lucky few hundred invited to Apple's long-winded press conference saw Newtons doing everything but leaping through flaming hoops. Demo highlights included handwriting recognition, transmission via infrared link of a data object, and a demo of a prototype Siemens NotePhone.

After the presentation, a few attendees even got to handle a Newton. Although the handwriting recognition was slow and not very accurate, the alpha unit did function with no cables attached.

Although Newton dominated personal digital assistant (PDA) discussions, General Magic Inc. didn't escape unmentioned. In response to a question about whether Apple would partner with the Mountain View, Calif., developer of Telescript, Apple President Michael H. Spindler said, "General Magic is a creation of Apple" and added that Apple would use Telescript if it made sense to do so when the technology ships.

Outside Apple's press event, the term "PDA" was everywhere. Tandy Corp. had a "Zoomer under glass," the PDA it is co-developing with Casio Inc.; Amstrad plc of London declared it had "the world's first PDA" (see MacWEEK, March 29); and Comika Corp. of Taiwan had Infoman, a pen-based device that the company said "even a child can learn to operate."

While PDAs scored high in sex appeal, the vast majority of Mac products on display were about enterprise solutions (see story, Page 1).

The Mac is used more in enterprise computing in Europe than in any other region, according to Apple. It showed, because almost every Mac product at CeBIT had "client-server" in its name or product description. □



HENNING CHRISTOPH/DAS FOTOARCHIV



Despite having its largest booth ever, Apple's display was dwarfed by the sheer magnitude of the CeBIT campus (left). This didn't stop the company from putting on a good show that included dancers performing with Macs (below).






From Quark's Nutty Professor (above) to Apple's full metal showroom (below), the Mac made a spectacle of itself. The Newton (left) offered a more refined interface, including a software keyboard.





Apple PIE executive Susan Schuman (right) made her presence felt from Apple's briefing to the Wireless USA symposium and even fit in a demo of Amstrad's Newton knockoff.




Apple Personal Interactive Electronics General Manager Gaston Bastiaens and Apple President Michael H. Spindler gathered with their new Newton friends for a family photo.

PHOTOGRAPHY BY HENNING CHRISTOPH/BLACK STAR

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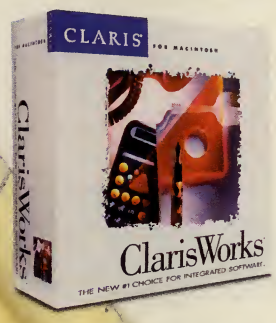
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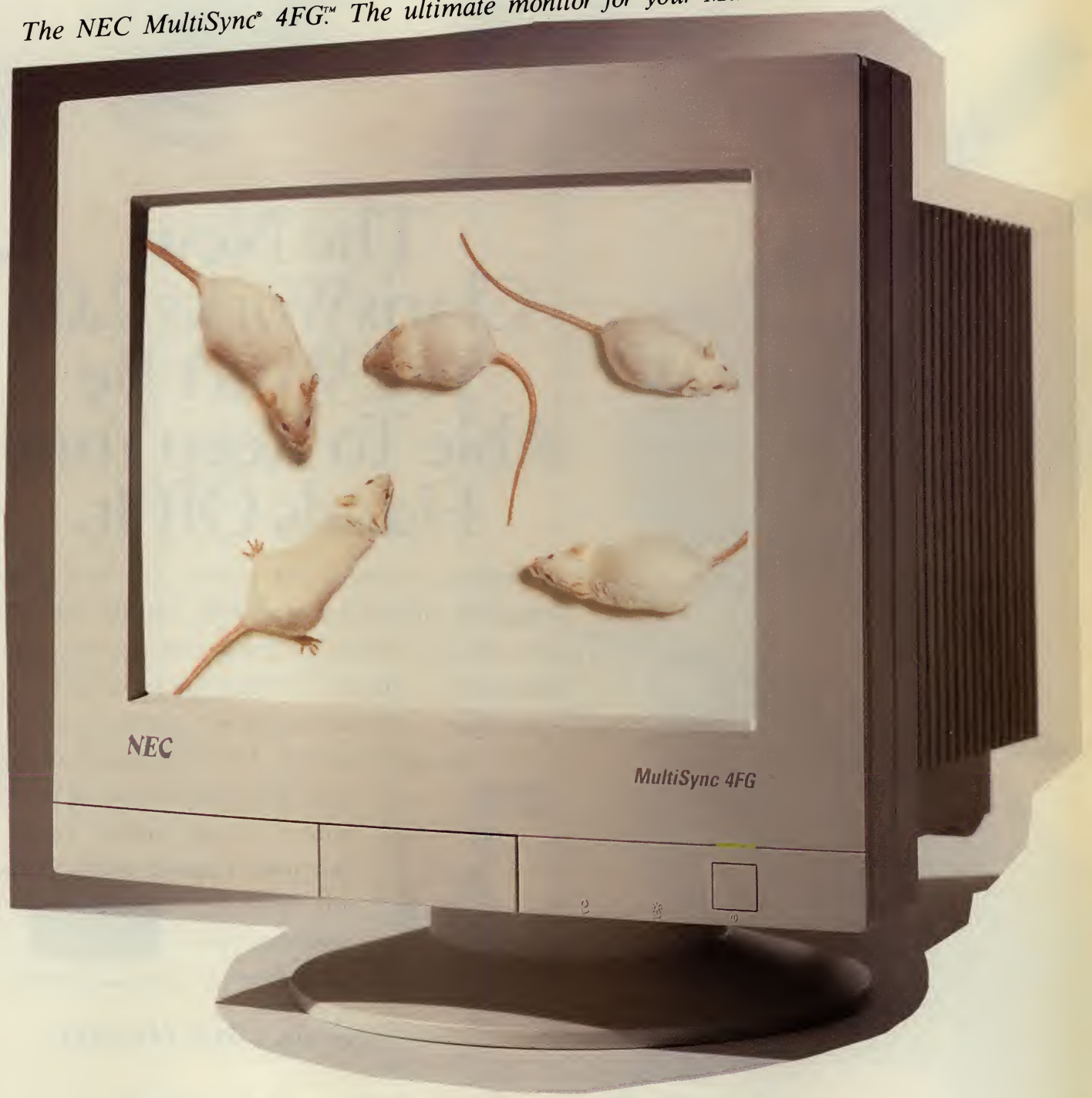
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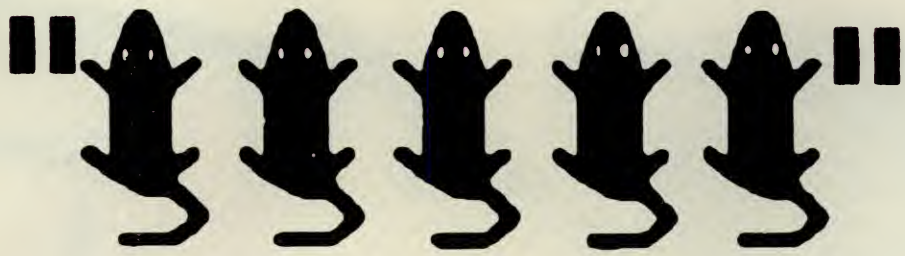
# Announcing a

*The NEC MultiSync® 4FG.™ The ultimate monitor for your Macintosh®.*




***At NEC, we've developed*** *hundreds of computer products expressly for Mac systems: from our highly-acclaimed MultiSync monitors, MultiSpin™ CD-ROM readers and Silentwriter® laser printers, to our Professional Graphics Series, which includes our new 27" MultiSync 3PG data monitor and MultiSync 6PG and 9PG Projection Monitors for images as large as 25 feet.*

"



"

*–MacUser Magazine*
*Aug.'92*

# better mousetrap.

*The NEC MultiSync® 3FGx™ monitor.*

*The least you should do for your Mac®.*




In 1992, the only monitor to snag the coveted five-mice rating was an NEC monitor: the MultiSync 4FG. After running it and 13 others through the most rigorous technical evaluation they'd ever used for testing monitors, *MacUser* magazine concluded, "If you're looking for the sharpest display, the NEC MultiSync 4FG should be your top choice." What more can we say? Glad you asked.

**Our AccuColor™ Control System** prompted *MacUser* to make special mention of the "easy color adjustments." AccuColor lets you adjust on-screen colors, so if you're looking for mouse-tail pink, that's what you'll get.

If, however, color control is not a priority for you, you'll be very happy with NEC's MultiSync 3FGx monitor, which shares almost all of the 4FG's award-winning features. Both monitors produce sharp, bright images, crisp graphics and vibrant colors. An Invar shadow mask provides increased brightness without loss of focus.

**Another big idea—the display area.** The large 15″ screen (13.8″ active display area) coupled with FullScan™ capability for edge-to-edge images gives you a larger display area than typical 13″ or 14″ RGB monitors.

How do you make an NEC MultiSync monitor work with your Mac? Just plug it in, using NEC's free FG/Mac cable adapter. It works with the Mac's on-board video, so you won't need an add-in video board.*

**Both monitors are compatible** with the Mac® II family, Quadra™ series, LC's, PowerBooks™ and PC systems. So you can use just one monitor for both types of platforms. *MacUser* noted the "powerful and versatile controls make switching from a Mac to a PC a snap."

And to make these monitors as user-friendly as possible, we've included ergonomic features such as a tilt/swivel base and up-front user controls. Plus, our Reduced Magnetic Field™ technology meets the strict Swedish MPR II guidelines for magnetic field emissions.

There are lots of reasons for considering an NEC MultiSync monitor for your Mac—the sharp, bright images, the vibrant colors, the large display area, the flexibility, the compatibility—to name five. And the  to name five more.

For more information on our award-winning monitors, call 1-800-NEC-INFO (in Canada: 1-800-343-4418). Or for a complete brochure via fax, call NEC FastFacts™ at 1-800-366-0476, request #62234.

*For Macintosh 640 x 480 resolution, just attach NEC's FG/Mac cable adapter and plug into: Macintosh IIsi, IIci, LC, LCII, IIvx, IIvi, Quadra™ 700, Quadra 900, Quadra 950, Performa™ 400, Performa 600, PowerBook™ 160, PowerBook 180, and the PowerBook 210 and PowerBook 230 with either the DuoDock™ or MiniDock.™ Or with an add-in video card: Macintosh II, IIx, IIcx, IIfx, PowerBook 140, PowerBook 145, and PowerBook 170. Get the 640 x 480 FG/Mac adapter free by calling NEC at (312) 622-7427 8:30AM-5PM CST.

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# NEC refreshes MultiSync monitors

By Nathalie Welch

Wood Dale, Ill. — NEC Technologies Inc. has introduced a trio of color monitors for business users. The MultiSync FGe line comprises:

- **MultiSync 5FGe,** a 17-inch color monitor due later this month for $1,155, supports resolutions up to 1,024 by 768 pixels at 82 dpi with a 75-Hz refresh rate. It features digital controls of image position and size, as well as a technology that extends display into the monitor's corners.
- **MultiSync 4FGe,** a 15-inch monitor due this month for $755, supports resolutions up to 1,024 by 768 pixels at 93 dpi with a 75-Hz refresh rate. It offers digital image adjustment and NEC's AccuColor Control, which lets users adjust on-screen colors through software.
- **MultiSync 3FGe,** a 15-inch monitor available now for $635, supports resolutions up to 1,024 by 768 pixels at 93 dpi with a 60-Hz refresh rate.

Prices reflect NEC's new policy of announcing "estimated selling prices" rather than standard retail prices.

The two 15-inch monitors are versions of NEC's $805 MultiSync 4FG and $685 MultiSync 3FGx with enhanced refresh rates. The older models have been discontinued.



NEC's new FGe line of color monitors includes two 15-inch displays and a 17-inch model.

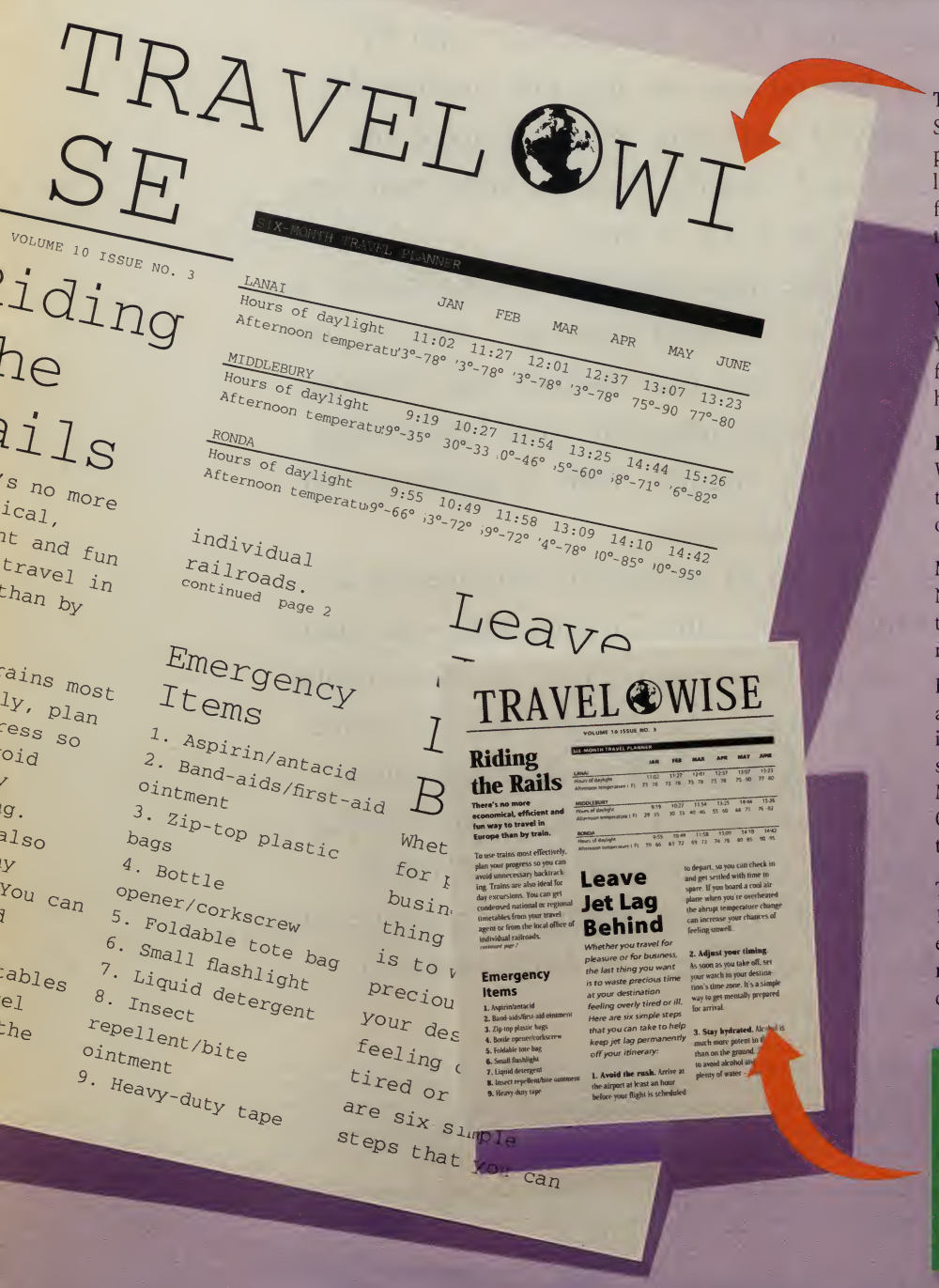
NEC is offering a $100 mail-in rebate to users who buy its $599 MacFG 24Xp interface card with an FGe monitor.

NEC said the displays meet Swedish safety standards for extremely low frequency and very low frequency emissions. All three offer tilt-and-swivel bases and front controls. The monitors come with three-year warranties.

NEC is offering a three-year warranty (up from two years) to users who buy its $1,355 MultiSync 5FG 17-inch color monitor or $2,455 6FG 21-inch model after April 5.

NEC Technologies Inc. is at 1255 Michael Drive, Wood Dale, Ill. 60191. Phone (708) 860-9500; fax (708) 860-5618. □

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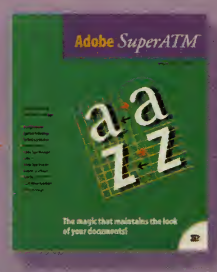
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# ASG packages offer help to 4D developers

By Robert Hess

Huntington Beach, Calif. — Automated Solutions Group last month shipped two packages of development tools for ACI US Inc.'s 4th Dimension.

- **Productivity Package Plus**, priced at $89.95, is an upgrade to ASG's interface development tools for 4D. Developers can use the package's "virtual structure" to make parts of a 4D database's underlying structure more clear.

It now lets developers rename fields without affecting the 4D structure, and reorder, show or hide fields to reflect the user's activities.

Productivity Package Plus also offers replacements for 4D's built-in search, sort and import-export editors. An on-line help system details the contents of these editors, separate from 4D's own balloon help.

New replacements for 4D's Alert, Confirm, Request and Message dialogs let developers customize button text in those dialogs. The package now includes six thermometer layouts, including multilevel indicators.

Upgrades are $69.95 from Version 1.0.x and $19.95 from Version 2.0.x.

- **SuperLabel for 4D** replaces 4D's label editor. ASG claims SuperLabel offers a superior interface and functionality. Labels can include 4D data and pictures and can be formatted differently from how the data exists in 4D.

SuperLabel can call 4D procedures before each label is printed, offering considerable customization. A "part used" feature gives users the ability to start printing a sheet at a specific location, skipping previous labels.

SuperLabel will sell for $150 until April 30, after which the price will be $195.

ASG is at 16742 Gothard St., No. 114, Huntington Beach, Calif. 92647. Phone (714) 375-4252; fax (714) 375-4257. □

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*Hewlett Packard Scanjet IIc—133 line screen, factory default settings.*



*HP Scanjet IIc*
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*Sillverscanner II*
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*La Cie Sillverscanner II—133 line screen, factory default settings.*

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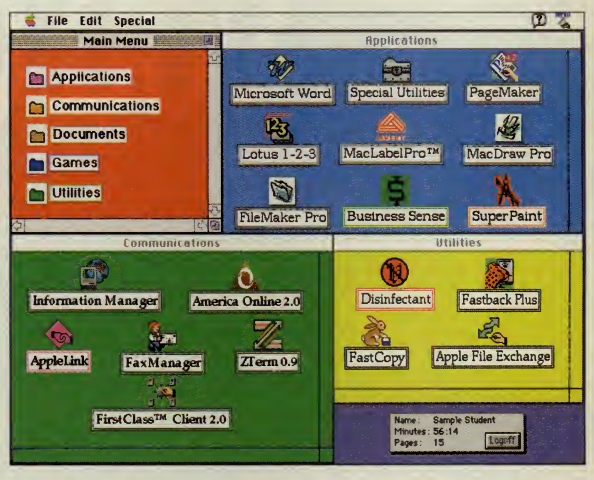

# ELS tightens administrator controls, security features of Finder overlay

**By Ian G. Jacobs**

Gainesville, Fla. — Electronic Learning Systems Inc. last month updated its Finder overlay to provide more administrative controls.

Menu Master Mac, priced at $99, is a desktop-management and security system that lets administrators create customized, simplified desktops for each user, limiting access to applications and files.

Version 1.3 allows administrators to password protect submenus and prevent specified users from inserting floppy disks. Users can log into the new version automatically without having to enter a password. Network users can now mount and unmount servers.




**Menu Master Mac 1.3 lets administrators password protect submenus such as Applications, Communications and Utilities shown here.**

Previous versions kept a log of cumulative usage and pages printed by each user. Version 1.3 can keep track of how long users spend in each application and how many pages they print from each application. Administrators can now organize the log files into usage reports with an included template from Claris Corp.'s FileMaker Pro.

ELS said Menu Master Mac offers a greater range of security, tracking and customizing features than At Ease, Apple's $59 simplified desktop. Menu Master Mac also competes with the $99.95 MacSecure, which Learning Performance Corp. of Minneapolis recently updated to Version 1.7 (see MacWEEK, Feb. 22).

Menu Master Mac is available in a $699 50-user version and an $899 100-user version. An unlimited site license is $1,299. Upgrades are $10 plus $3.50 shipping and handling, or free to users who bought the previous version after Jan. 1.

Electronic Learning Systems Inc. is at 4131 N.W. 28th Lane, Gainesville, Fla. 32606. Phone (904) 375-0558 or (800) 443-7971. □

# Workstation develops small camera for use in video applications

**By Nathalie Welch**

Irvine, Calif. — Workstation Technologies Inc. has released a small video camera for use in third-party desktop digital video and videoconferencing systems for Macs and IBM PCs and compatibles.

Available now to OEM customers, the black-and-white analog camera sells for $160 to $225, depending on quantity. A color model is scheduled to ship later this month for about $50 more.

The device, slightly larger than a standard mouse, can sit on top of a computer monitor. It works with any video digitizing hardware and software.

Based on interline transfer CCD (charge-coupled device) technology, the camera has a depth of field from 1 foot to infinity. Its automatic iris adjusts to varying light conditions.

It works as a standard NTSC or PAL (European) video input device on any computer, television or VCR.

Northern Telecom Inc. of Nashville, Tenn., said it will use the camera as part of its Visit Video teleconferencing system.

Workstation Technologies said other possible applications for the camera include desktop presentation systems, video mail, computer-based training, security systems and QuickTime movie making.

Workstation Technologies Inc. is at 18010 Skypark Circle, Irvine, Calif. 92714. Phone (714) 250-8983; fax (714) 250-8969. □

# Loviél Arrow hits Fast SCSI-2 speeds

Edina, Minn. — Loviél Computer Corp. last month released the Loviél SCSI Arrow, a $899 Fast SCSI-2 NuBus card.

Using a board from BusLogic Inc. of Santa Clara, Calif., the SCSI Arrow provides burst transfer rates of up to 10 Mbytes per second when hooked to a Fast SCSI-2 drive. It ships with driver software that is installed automatically when the card is connected.

Developed in conjunction with Trillium Research Inc. of Hudson, Wis., the SCSI Arrow is designed to be used with Loviél's two disk array towers as well as other Fast SCSI-2 devices.

The R1 tower, available now for $10,000, supports up to six full-height 5.25-inch drives for a total of up to 11 Gbytes. The LARC, due next month for an unannounced price, will hold up to five 3.5-inch drives. The Seagate, Quantum or Fujitsu mechanisms are available separately from Loviél.

The SCSI Arrow card will also be bundled with Trillium's $695 Remus disk array software, which will support features such as parity distribution, disk striping and mirroring, when the software is released next month.

Loviél Computer Corp. is at 5599 W. 78th St., Edina, Minn. 55439. Phone (612) 828-6880 or (800) 688-3696; fax (612) 828-6881. □

# Give your network a future.



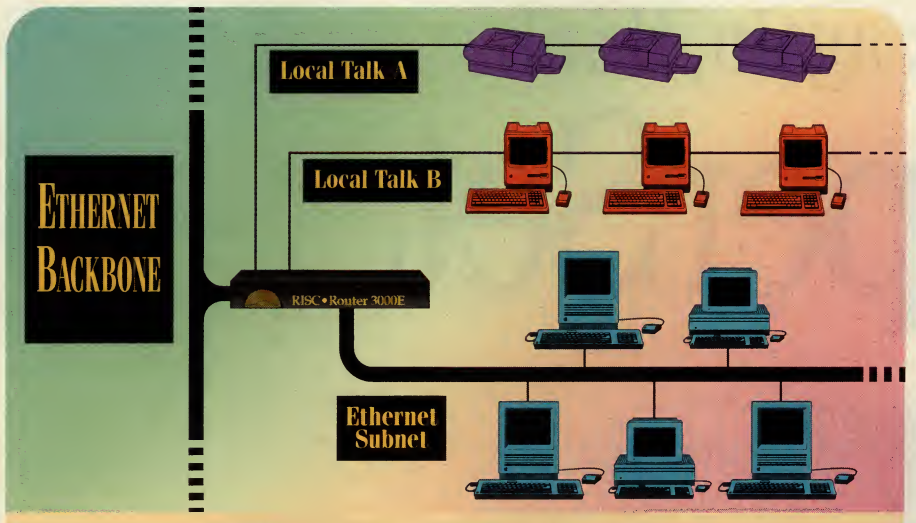

*RISC·Router 3000E Ethernet-to-Ethernet Router, with 2 LocalTalks, $2995.*

**Q:** *Why does my network need Ethernet-to-Ethernet routing?*

**A:** Performance and reliability. By using a RISC·Router 3000E to link an Ethernet subnet to a central backbone network, you can reduce network traffic on both sides of the router.

**Q:** *How does RISC·Router 3000E give my network a future?*

**A:** It gives you an upgrade path. RISC·Router 3000E includes two LocalTalk ports, and can be installed for about the same cost as an Ethernet-to-LocalTalk router like the GatorBox or FastPath. As your Macintoshes on LocalTalk require additional network speed, you can simply upgrade them to Ethernet and connect them to RISC·Router 3000E's Ethernet subnet.




*RISC·Router 3000E creates an Ethernet subnet . This makes both the subnet and the backbone faster. It also creates a "firewall" which isolates each of the networks from problems on the other.*




*Route between two Ethernets and two LocalTalks for about the same cost as a GatorBox or a FastPath.*

**Q:** *Does the RISC·Router 3000E support the standard set of features I've been using on my Ethernet-to-LocalTalk routers?*

**A:** Absolutely. And more! It supports AppleTalk Phase I and Phase II, TCP/IP and DECnet, MacTCP, atalkad, AppleTalk in IP tunneling, RIP, SNMP, and our own Advanced Network Security Protocol (ANSP™).

**Q:** *What advantages does the RISC·Router have over other Ethernet-to-Ethernet routers?*

**A:** Macintosh based management tools. A Macintosh-aware feature set, with ANSP™ and Ethernet-to-Ethernet tunneling. Support for thick, thin, and 10BaseT Ethernet on each Ethernet port. Dazzling performance, and a very aggressive list price.

**Q:** *How can I get more information, and complete technical specifications?*

**A:** Call us toll free at 800-356-0283. We'll be happy to send you complete information on RISC·Router 3000E, and our other Macintosh Ethernet products.

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# Dynamic offers boost to PowerBook processors, RAM

**By Raines Cohen**

Ben Lomond, Calif. — Dynamic Engineering last month announced a slew of upgrades for PowerBooks.

The company is now offering:

▸ **Processor upgrades.** Users can send in PowerBook 140s for upgrades from 16 MHz to 25 MHz, priced at $399, including overnight shipping and insurance. In the operation, which voids the Apple-provided warranty coverage, Dynamic replaces a system's 68030 CPU with a higher-speed version and changes some support circuitry. A 33-MHz CPU upgrade is $549.

Dynamic also offers math coprocessor upgrades for the PowerBook 140, 145 and 160, which add a Motorola 68882 FPU (floating-point unit) for $299 in a 25-MHz version or $399 in a 33-MHz version.

A combination 25-MHz 68030 and FPU upgrade is $499 for PowerBook 140 users.

Users of the 140, 145, 160 or 170 can go all the way to a 33-MHz CPU and FPU for $725.

▸ **PowerBook RAM.** Dynamic offers RAM upgrades in a variety of configurations for the different PowerBook models. PowerBook 100 users can get a 2-Mbyte module for $60 or 6 Mbytes for $249. PowerBook 140, 145 and 170 users can get 2 Mbytes for $60 or 6 Mbytes for $229.

The faster RAM recommended for the PowerBook 160 and 180 sells for $189 for 4 Mbytes, $259 for 6 Mbytes, $379 for 8 Mbytes and $449 for 10 Mbytes.

RAM for the PowerBook 165c is priced from $232 to $510 for 4 to 10 Mbytes.

Duo 210 and 230 users can add 2 to 12 Mbytes for $129 to $599.

▸ **Portable RAM.** Users of the original Mac Portable can add RAM to the system's processor direct slot for $209 to $659 for 1 to 8 Mbytes. Dynamic also sells Portable batteries for $59.

Dynamic Engineering is at 435 Park Drive, Ben Lomond, Calif. 95005. Phone (408) 336-5531 or (800) 487-4655; fax (408) 336-3840. □

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ScreenLink™ lets you control another Mac's screen, keyboard and mouse over a network or via modem. ScreenLink works with both System 6.0.4 and later and System 7. Only SuperSet includes remote access and control capabilities.

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|---|---|---|---|---|---|
| SuperSet | ✓ | ✓ | MACWORLD Editors' Choice | ✓ | ✓ |
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# Kensington adds on Adding Machine app to external key pad

**By Ian G. Jacobs**

San Mateo, Calif. — Kensington Microware Ltd. this week will release a new adding-machine program and bundle it with the company's external numeric key pad.

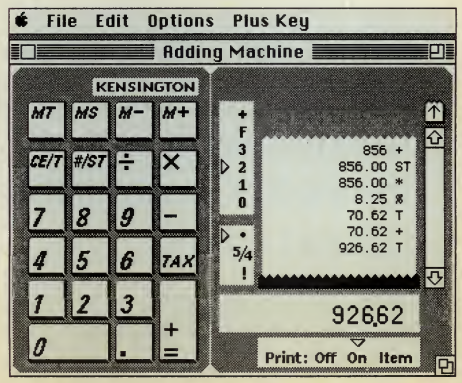
The $49.95 Adding Machine software has two modes, one for adding-machine functions and one for calculator functions. The adding-machine mode lets users program the plus key to perform functions such as taxation and percentage calculations. The calculator mode mimics the functions of simple calculators.

An electronic "paper tape" kept as users calculate figures can be copied, pasted and printed. Data can be exported to and imported from other applications, such as Microsoft Excel, via the Clipboard or text files.

The software comes with a license letting users run it on up to three separate Macs.

Kensington's NoteBook KeyPad is now available in a $149.95 bundle that also includes a pass-through Apple Desktop Bus connector and the Adding Machine software. The KeyPad alone, previously $149.95, has been reduced to $119.95.

Kensington is at 2855 Campus Drive, San Mateo, Calif. 94403. Phone (415) 572-2700 or (800) 535-4242; fax (415) 575-9675. □




**Kensington Microware's Adding Machine includes an electronic "paper tape" kept as users calculate figures.**

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Management

# Proactive steps can help defray workers' comp costs

*Managers can help create an environment to prevent RSI and stress problems.*

By Reese Erlich

Mac managers need to take initiatives to prevent on-the-job injuries, or their companies' workers' compensation insurance rates are bound to rise, according to experts.

Workers' compensation, an insurance system for on-the-job injuries, provides payments to medical providers and injured employees when an employee claims injury at work. Companies buy workers' comp coverage through private or state-operated insurance companies. The more often its workers file claims, the higher a company's premiums will be.

Mac managers once thought job injuries happened only at factories and construction sites. Not any more. Repetitive strain injury (RSI) from pounding a keyboard all day and mental stress now top the list of office injuries, according to insurance company executives.

**RSI cases on the rise.** Many states have seen an explosion in RSI workers' comp claims in the past few years. According to the California Division of Labor Statistics and Research, the number of carpal tunnel syndrome incidents went up 24 percent from 1990 to 1991.

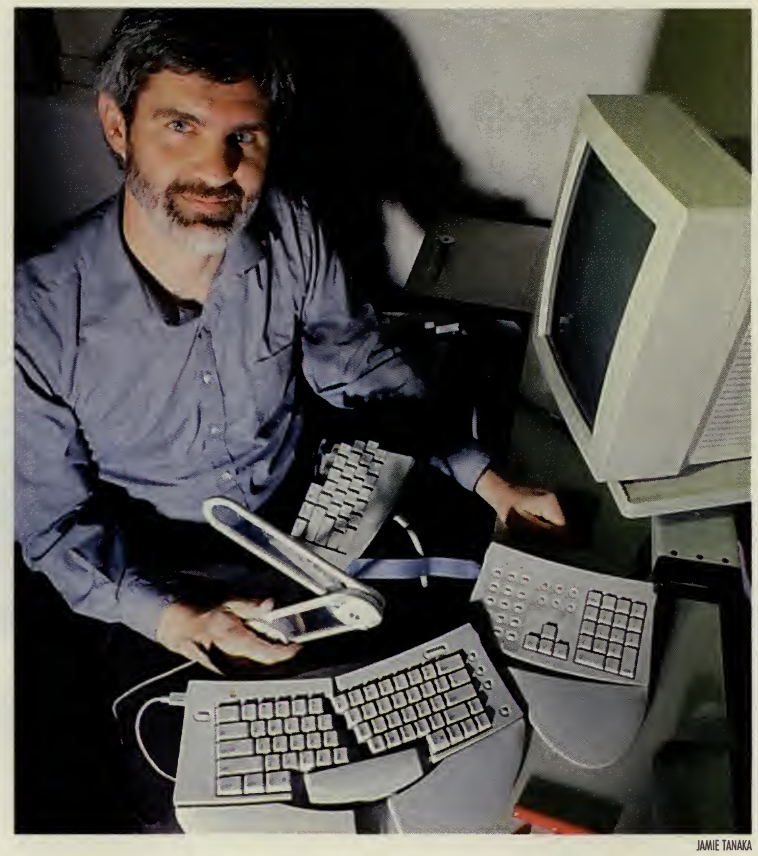
"RSI is the largest source of new workers' comp cases in the country," said Arnold Lakind, an attorney in Lawrenceville, N.J. He and other lawyers have filed several hundred cases against Apple, IBM Corp. and keyboard manufacturers for causing RSI (see MacWEEK, June 15, 1992). These cases were filed as third-party liability claims, which can deliver much larger settlements than workers' comp.

"RSI is increasing at alarming rates," Lakind said, "particularly among data-entry workers."

Pat Gallup, president and CEO of PC Connection (parent to Mac Connection) of Marlow, N.H., said the number of RSI complaints at her company has been low, but "it's the largest single cause of injury. It's the only [injury] issue really facing our office." More than half of her 450 employees use Macs for jobs such as order taking, word processing and graphic design.

Dr. David Rempel, director of the Richmond, Calif., Ergonomics Lab for the University of California Medical Center, recommends improving workstation ergonomics while scientific research continues on the issue of keyboard safety. He said medical researchers have not conclusively proven that features of any keyboard cause RSI.

"There are many factors that could cause such injuries," Rempel said. Workstation ergonomics and stress, as well as keyboard design, could be contributing factors. He is currently studying keyboard designs and safety.



JAMIE TANAKA

Dr. David Rempel, director of the Ergonomics Lab at the University of California Medical Center, is overseeing a study of keyboards that could suggest new designs to make them safer.

**Proactive ergonomics.** While scientists and lawyers hash out keyboard design issues, Phil Gerber, MIS director at Norm Thompson Outfitters, said Mac managers can take concrete steps to deal with workstation problems. Outfitters, a Portland, Ore., outdoor supply company, uses more than 50 Macs for spreadsheet analysis, decision support functions and catalog preparation.

Gerber recalled when some workers at his company first complained about problems with their wrists, hands and vision. He suspected that outside activities aggravated the problem. "People had just joined a bowling league," Gerber said.

Nevertheless, Outfitters "took action to raise monitors and adjust the keyboard stands," he said. "We allow employees to get up whenever they feel the need. There are no leg irons attached to the chairs."

**Mental stress.** Many Mac managers suspect that employees complaining of stress are either faking or that the problems aren't work-related, said Charles Mitchell, executive vice president for risk management at C.E. Heath, a workers' comp insurance company in San Francisco.

Mitchell said he does see many fake claims, particularly those filed en masse after a company closes down or moves offices.

However, "a lot of stress claims are real," he said, "whether we like it or not."

In California, the number of mental stress injuries resulting in lost work days shot up nearly 50 percent from 1990 to 1991, according to state government statistics.

Shirley Ford's case is typical. Her job at a Southern California insurance company consisted of looking up information on four different Macs sitting on her desk. The company forced her to take on a supervisor's job with no pay increase.

"The stress just kept building," Ford said. "I had headaches, a backache and even lung problems. The doctors said they were work-related."

Ford finally quit and received a $3,500 workers' comp settlement for mental stress. She said her employer could easily have avoided the workers' comp claim "had they been fair with me. I wasn't out for money. I wanted to be treated as a human being."

Ford's case illustrates some important lessons for managers.

Managers need to create a "positive, upbeat work environment," said PC Connection's Gallup. "If there's a lot of stress, then workers' compensation claims go up."

Julia Faucett, a nursing professor at the University of California Medical Center in San Francisco, has studied stress issues in the workplace. She urged Mac managers to look out for signs of worker stress: absenteeism, irritability and increased interpersonal problems, headaches, or increased complaints of general aches and pains.

"If several people show up with the same problem, that should send up a red flag," she said.

She recommended that managers make periodic assessments of worker complaints of stress. If several people are feeling stressed, it's important "to bring people together to air their concerns. Be supportive and resolve conflicts quickly," Faucett said.

More-difficult cases should be referred to an occupational health nurse or qualified mental health professional, she said. □

## How to prevent on-the-job injuries

Workers' comp claims at Mac offices can vary from the mundane — staple and fastener cuts — to the life-threatening, according to Charles Mitchell, executive vice president for risk management at C.E. Heath, a workers' comp insurance company in San Francisco. He regularly advises managers on how to keep down workers' comp claims and thus help reduce the costs of insurance.

Serious and complicated injuries can result from repetitive strain injury or stress on the job. Here are Mitchell's recommendations on how managers can help prevent injuries.

- **Communicate.** Talk to your employees and, more importantly, let them talk to you. Memos from your office are not enough to resolve safety issues. Visit every work station to make sure it's set up ergonomically.
- **Listen.** Take employee complaints seriously. Several people complaining of headaches could mean you need glare screens or that workers are getting stressed out.
- **Check the air.** If workers regularly complain of headaches, make sure the oxygen level in your office is adequate. A bad air-conditioning system can lead to "sick-building syndrome" and end up costing your company a bundle in absenteeism and possible lawsuits.
- **Use ergonomic equipment.** Customize changes to meet particular workers' needs. Keyboard drawers and foot and wrist rests may be great for some people — and hated by others. What's needed at each workstation to promote a healthy work environment?
- **Get professional advice.** Demand — don't just ask — that your workers' comp carrier inspect your office. Ask the company to help organize a safety program. "Some carriers don't like the hassle of on-site visits," Mitchell said, "but that should be part of the service."
- **Organize in-house.** Create a safety committee that includes employees. Let them periodically inspect the office and follow reasonable recommendations to improve office safety. Regularly post notices with results of committee action.
- **Articulate your policies.** Make clear that the company puts safety — not just production — first. Develop an orientation for new hires that explains company safety rules, and make safety consciousness part of a job performance evaluation. — By Reese Erlich

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## Helios takes on new Apple servers

*EtherShare upgrade boosts server speed*

**By April Streeter**

Cupertino, Calif. — Helios USA is upgrading its AppleShare-compatible Unix-based server software in an effort to go head to head with Apple's forthcoming Workgroup Servers.

EtherShare 2.2, due next month for $4,990 for a single-server, 245-client version, includes new support for Unix workstations based on AT&T System V or Release 4. EtherShare provides file and print services and includes AppleTalk Phase 2 routing.

According to Helios, the performance of EtherShare 2.2 running on a Sun SPARCstation 10/30 averages 140 percent better than that of a comparable AppleShare Workgroup Server 95, which is based on a Quadra 950. Eager to take on the new Apple servers, Helios will freely distribute a program that lets users conduct their own benchmark tests (see story below).

Version 2.2 adds file-name mapping among Mac, Unix and DOS clients on the EtherShare network. A new cache improves desktop rebuilding, Helios said.

The upgrade also eliminates a Unix feature that required secondary users to change a file's rights before being allowed to access it.

The upgrade also lets users manage their own print jobs in EtherShare's print queue from the desktop, a feature previously reserved for administrators.

Users who purchased Version 2.0 after the beginning of the year will receive a free upgrade. Others not on a Helios service contract will pay $1,195.

Helios USA, a division of Helios Software GmbH of Hanover, Germany, is at 10601 S. De Anza Blvd., Suite 103, Cupertino, Calif. 95014. Phone (408) 864-0690; fax (408) 864-0694. □

### Free utility lets users test-drive servers

Helios USA is offering a free benchmarking utility to help users assess the performance of AppleShare servers on their own networks.

Lantest runs on any Mac and tests an AppleShare or AppleShare-compatible server by performing the following tasks: creating, opening, closing and deleting 100 files; copying and reading a 3-Mbyte file; locking and unlocking data 4,000 times to simulate database activity; and scanning a 320-file directory.

Meters show server performance and calculate average speeds in seconds. For copying and reading tests, averages are given in kilobytes per second.

Helios said the software is available by calling the company's AppleTalk Remote Access server at (408) 252-9585 and logging on with the word POWERTEST; no password is required.

## Apple, IBM to develop Mac client for OS/2-based version of CICS

**By Henry Norr**

White Plains, N.Y. — Mac users will soon be able to process orders and enter reservations with the best of their Blue-blooded colleagues.

IBM Corp. and Apple last week announced plans to develop a Mac client for a new OS/2-based version of CICS, or Customer Information Control System, IBM's on-line transaction-processing software.

The forthcoming client, due by year-end, will run on any Mac connected via Ethernet or token ring to a server running CICS OS/2 2.0, a new version due for release in September.

The system, which will use IBM's AppleTalk for OS/2, will also support PowerBooks connected via AppleTalk Remote Access.

The OS/2 server will also support DOS, Windows and OS/2 clients.

IBM will market the Mac client, but Apple is negotiating for the right to market it as well, officials for the companies said. Pricing has not been set. CICS OS/2 2.0 servers will start at $3,995, and software for other clients will start at $150.

CICS, a standard in the transaction-processing field, is used at some 20,000 sites worldwide, according to IBM. It is traditionally run on mainframes, but IBM last week released an AS/400 version, and an RS/6000 version is due in June. □

## Neon to unfurl LANsurveyor network mapping tool

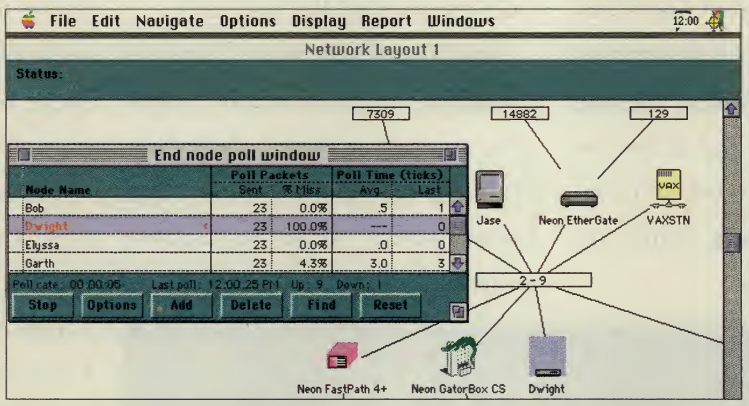
*Software makes use of SNMP agent*

**By Leonard Heymann**

Lafayette, Calif. — If seeing is believing, a new product Neon Software Inc. is shipping this week can help network managers learn the truth about their AppleTalk networks.

LANsurveyor draws a logical map of an AppleTalk network that serves as a graphical interface to built-in polling and monitoring capabilities. In addition, Neon's RouterCheck and third-party management tools can be launched from a LANsurveyor map via Apple events.

The new product is one of the first applications to make use of Apple's SNMP (Simple Network Management Protocol) agent, called AppleTalk Connection for Macintosh, which can monitor network devices and send profile data to management software.




**Neon's LANsurveyor constructs a map of an AppleTalk network that an administrator can use as a platform for network management.**

LANsurveyor maps can be expanded and contracted to include end nodes or only routers and backbones. Devices pictured can be monitored individually or in groups. Alarms can be set to notify administrators when devices have failed or are experiencing high numbers of errors. Alerts display on screen or sound alarms. LANsurveyor can also send text messages via CE Software Inc.'s QuickMail or Ex Machina Inc.'s Notify! paging system.

While other mapping products are available, such as Farallon Computing Inc.'s NetAtlas and The AG Group Inc.'s NetWatchman, and many products manage and report on the configuration of network nodes, Neon is positioning LANsurveyor as an all-in-one management platform. One beta tester

*See Neon, Page 20*

## NetWare utilities will let users assume net-management chores

**By April Streeter**

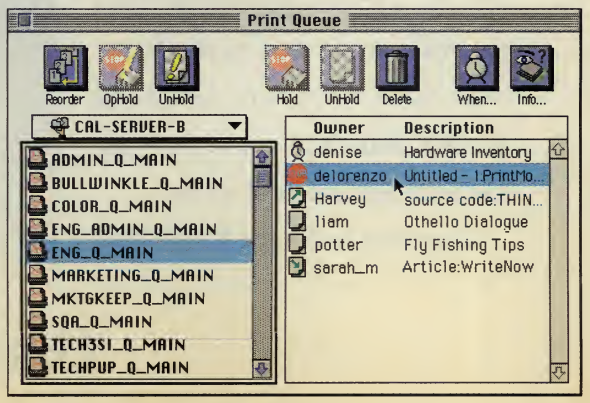
Provo, Utah — Novell Inc. is developing a bundle of NetWare utilities that will let Macintosh users perform many network housekeeping chores from their own desks.

NetWare Tools for Macintosh will be included with NetWare for Macintosh 4.0, due in June, and offered as a separate product called NetWare Workstation for Macintosh. The package, which includes log-on and notify utilities, will cost between $30 and $50 per site, according to Novell.

The tools afford Mac users rights and services similar to those available to DOS and Windows NetWare clients. To accomplish this, the tools talk to 3.x or 4.0 NetWare servers by adding information to AFP (AppleTalk Filing Protocol) packets sent between AppleTalk clients and a server. The utilities give Macs access to services beyond those allowed by AFP, including:

- **Rights and attributes.** While NetWare administrators assign users' overall rights, the new utility lets authorized users see their rights, see users with similar rights, and assign or remove trustees' rights.
- **User and group setup.** Mac clients can add or delete users, set up groups, and assign or change passwords.
- **Print queue access.** Authorized users can manage NetWare's print queues to schedule, hold or halt print jobs sent from any client to any network printer.
- **Simple messaging.** This feature lets users locate others on the NetWare network and send text messages of up to 50 characters.

Novell Inc. is at 122 East 1700 South, Provo, Utah 84606. Phone (801) 429-7000 or (800) 453-1267; fax (801) 429-5155. □

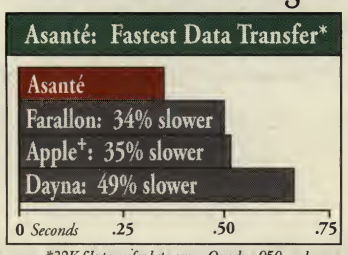



**NetWare Tools for Macintosh includes a feature that allows authorized users to browse the NetWare network for available printers and schedule, delete or rearrange the order of print jobs.**




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**32K file transfer between a Quadra 950 and Quadra 700. Source: Recommended Test Labs, Inc. 1993. Call Asanté for complete report.*

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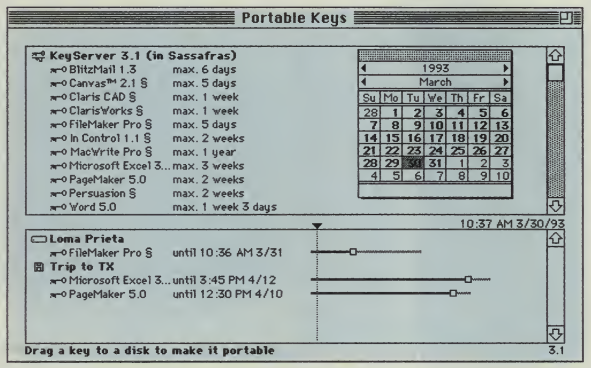
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# KeyServer 3.1 offers software licenses to go

*New version adds backup license servers*




**Sassafras Software's KeyServer 3.1 offers a KeyCheckout utility that lets users take licensed network software home or on the road.**

**By Nathalie Welch**

Hanover, N.H. — Network managers looking for the license to dole out software that workers can use outside the office may want to check out the new version of Sassafras Software Inc.'s KeyServer, shipping this week.

Version 3.1 of the KeyServer software license manager offers a utility, called KeyCheckout, that creates a portable key of licensed networked software, which includes a fixed expiration date.

Like previous versions, KeyServer 3.1 lets administrators control the number of simultaneous users who can launch licensed applications. Per-client prices range from $35 to $70.

"With the ability to create portable keys, people who want to use licensed software at home can now do so," said Kevin Garceau, a Mac and IBM PC and compatible specialist at Charles Stark Draper Laboratory Inc. of Cambridge, Mass. "We also use it in emergency backup situations. When network failures prevent connection to the main KeyServer, a portable key on disk lets a user remain productive."

A new KeyShadow feature lets administrators set up backup servers on the network that take over KeyServer duties in case the connection to the main KeyServer is broken because of a bridge or router failure. KeyShadow automatically returns service back to the main KeyServer when the network connection is re-established.

"It's quite amazing to see [KeyShadow] wake itself up to a server state after it recognizes that it can no longer defer requests to the main KeyServer and start handing out keys," Garceau said.

KeyServer 3.1 adds support for MacTCP for sites that use TCP/IP.

Other enhancements to the program, which resides on one nondedicated networked Mac, include new reporting modules to provide more complete usage summaries and detailed information regarding keyed and unkeyed applications.

Sassafras is also offering a free copy of KeyAudit, a utility that helps network administrators convert their location into a KeyServer-controlled site by producing a listing of all installed applications on a Mac.

Sassafras Software Inc. is at P.O. Box 150, Hanover, N.H. 03755. Phone and fax (603) 643-3351. □

# PacerTerm 2.0 gets SoftKeys icons, scripting commands, dash of color

**By April Streeter**

La Jolla, Calif. — Pacer Software Inc. last month shipped an upgrade to its terminal-emulation software that adds a splash of color, new scripting commands and iconized programmable buttons.

The $249 PacerTerm 2.0 can emulate VT100, VT320 and TTY terminals and can support additional emulations through Macintosh Communications Toolbox tools.

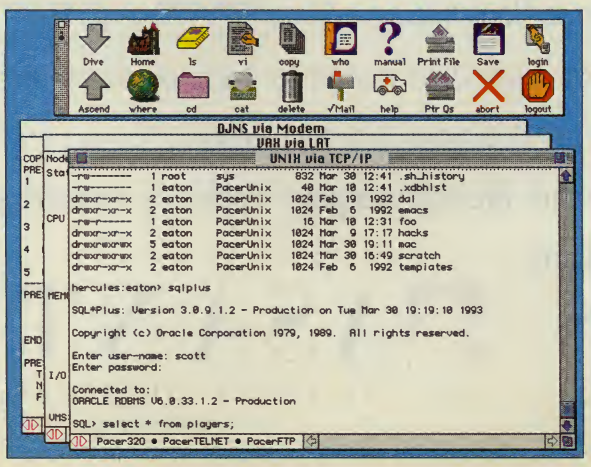
The upgrade adds the following enhancements:

- **VT320 additions.** Users of the VT320 emulator can now assign different colors to text with special attributes such as bold or underlined. It will also allow users with 12-inch monitors to display 127 lines of host data, compared with the 24 lines previously allowed. Using a special narrow font, 132 columns can be displayed without scrolling. The program supports VT320 print features, such as print page and print cursor line.
- **SoftKeys iconized.** Pacer's SoftKeys are programmable buttons that issue commands or run scripts during a host connection. In Version 2.0, SoftKeys can be represented by colored icons and loaded and saved into palettes of up to 20 icons each.
- **Scripting.** Parsing performance for scripts has been improved by an average of 50 percent, according to Pacer.

New script commands include the ability to control terminal window size and location on a user's screen. A Watcher command will wait for a specific action on the host before continuing a script, and a Waiter can perform tasks on a periodic basis.

Upgrades are $49.95.

Pacer Software Inc. is at 7911 Herschel Ave., Suite 402, La Jolla, Calif. 92037. Phone (619) 454-0565; fax (619) 454-6267. □




**Pacer's new version of PacerTerm lets users attach colored icons to scripts, which can be double-clicked, to perform different tasks during terminal emulation.**

## Neon

*From Page 18*

has already embraced that idea.

"LANsurveyor is going to become the control center for my network," said Marcelo Vergara, microcomputer systems specialist for Payless Cashways Inc. of Kansas City, Kan., which operates a chain of home-improvement stores. Through Apple events, Vergara said he can double-click on an icon for a Farallon StarController hub, for example, to launch Farallon's StarCommand management software.

LANsurveyor is priced at $395 for a five-zone version and $695 for an unlimited version.

Neon Software Inc. is at 3685 Mt. Diablo Blvd., Suite 203, Lafayette, Calif. 94549-3723. Phone (510) 283-9771; fax (510) 283-6507. □



## Gateways BRIEFS

### DataClub combines features of Classic, Elite

Provo, Utah — Novell Inc. late last month shipped a new version of DataClub that rolls together the two versions of the distributed server software it acquired last year from International Business Software Inc.

Previously, the $395 DataClub Classic provided a "virtual" server distributed among as many as 125 Macs, while the $1,395 DataClub Elite allowed data distribution but also let individual Macs function as dedicated servers. The new DataClub merges these two capabilities into a $595 program Novell said will afford users better performance than either Classic or Elite, although benchmarks were not available. As many as 250 Macs can join the DataClub network if at least one Mac is dedicated to file service, the company said.

Novell Inc. is at 122 East 1700 South, Provo, Utah 84606. Phone (801) 429-7000 or (800) 453-1267; fax (801) 429-5155.

### Cayman GatorBox EX and gateway software ship

Cambridge, Mass. — Cayman Systems Inc. is now shipping a new Ethernet-only router along with updated gateway software that it said will speed up data exchange between Macs and Unix systems.

The $3,495 GatorBox EX has two Ethernet ports and supports AppleTalk Phase 2, TCP/IP and Digital Equipment Corp.'s DECnet Phase 4 routing. Cayman's feature for tunneling AppleTalk within Internet Protocol packets is included. GatorShare, Cayman's gateway software for access between AFP (AppleTalk Filing Protocol) and Network File System clients and servers, costs an additional $995. The optimized version of GatorShare runs an average of three times faster on the EX than on other Cayman routers, such as the GatorBox CS, Cayman said.

Cayman Systems Inc. is at University Park at MIT, 26 Landsdowne St., Cambridge, Mass. 02139. Phone (617) 494-1999; fax (617) 494-1124.

### Piiceon cuts Dispatcher PB modem price 27 percent

San Jose, Calif. — Prices of internal PowerBook modems continue to drop as Piiceon Inc. last month slashed the cost of its Dispatcher device 27 percent to $329. Dispatcher can send and receive data and faxes at 14.4 Kbps. Similar devices from other vendors can cost as much as $500, although some mail-order companies offer modems in the same price range as Piiceon's.

Bundled with FAXstf fax software and Software Ventures Corp.'s MicroPhone LC data-communication software, Dispatcher supports MNP levels 2 through 5, as well as MNP 10 to optimize cellular modem connections. Piiceon is also offering a bundle containing Spectrum Cellular's cellular interface for an additional $199.

Piiceon Inc. is at 1996 Lundy Ave., San Jose, Calif. 95131. Phone (408) 432-8030; fax (408) 943-1309.

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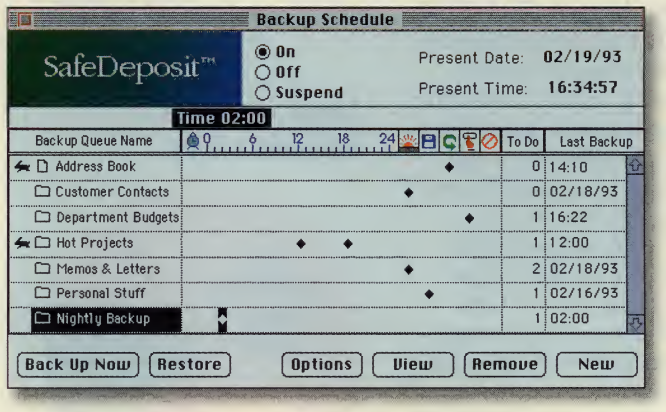
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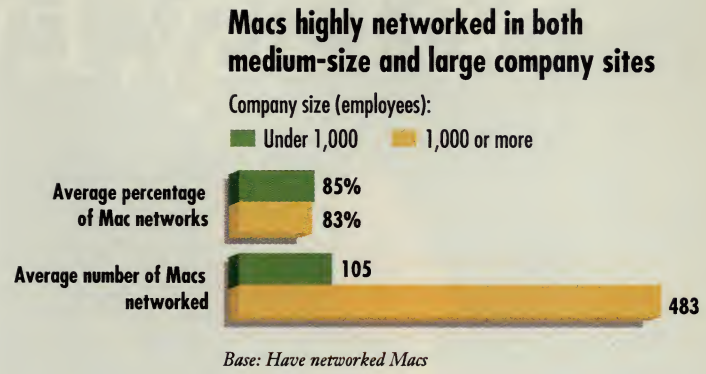
Macintosh Networking Specialists

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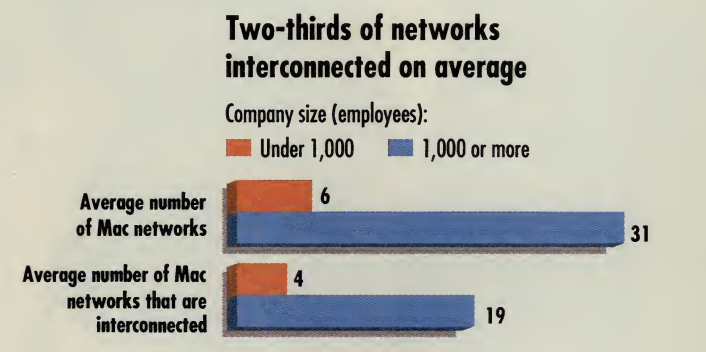
Research Report

# Survey reveals the details, effects of network growth

*For the past two years, MacWEEK has surveyed subscribers to try to identify the forces shaping Macintosh networks. This Special Report presents two new pieces of research analysis: how the networks in large companies differ from those in medium-size ones, and how the growth of an Ethernet infrastructure is affecting the demand for network applications. Two additional stories explore the effects of group scheduling and other collaborative network applications on real-world sites.*




*Base: Have networked Macs*




*Base: Have networked Macs*

# Bigger Mac networks are more diverse

**By Amanda Iles**

According to the 1993 MacWEEK Networking Study, Macintosh networks at sites with 1,000 or more employees aren't much different from networks at smaller company sites — except that the big ones have to fit into mainframe-based networks as well as local LANs. And the buying habits of smaller and larger companies are expected to diverge along those lines in the future, the poll found.

**Bigger is bigger.** MacWEEK conducted a study among subscriber Macintosh sites with at least 50 Macs installed, and the results of the study were analyzed to assess how a company's size affects the way it employs Macs in networks. Respondents were separated into two groups: medium-size companies with fewer than 1,000 employees and large companies with 1,000 employees or more. Large companies outnumbered medium ones by a ratio of nearly 4-to-1 in the survey.

Unsurprisingly, the survey found that large-company sites have larger and more-sophisticated networks, plus a wider variety of non-Macintosh computers.

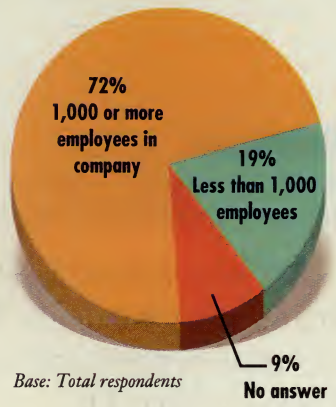
As Macs and IBM PCs and compatibles have become part of corporate networks that were originally centered around mainframe hosts, large companies have required a variety of hardware and software to connect the microcomputers. Cross-platform tools, such as non-Mac servers, terminal emulators and high-speed network media, figure more prominently on big sites' lists of planned purchases.

The medium-size sites, however, make up more than twice the proportion of Mac-only networks and are slightly more interested in making purchases for workgroup-oriented devices, such as hubs and network modems.

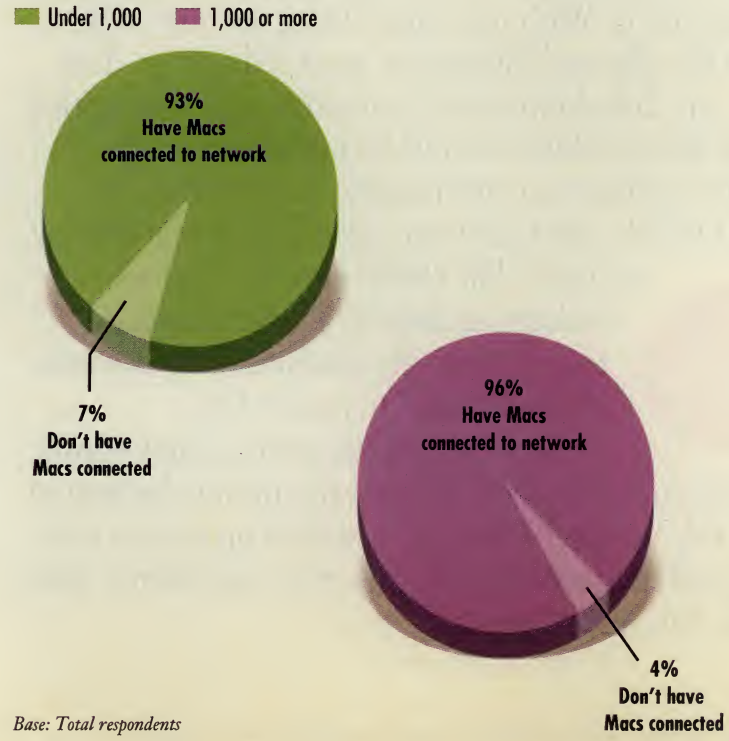
**The lay of the LAN.** The average percentage of Macs that are networked differs little between large and medium sites — 83 percent vs. 85 percent. But not surprisingly, the absolute number of Macs networked is much higher for large company sites: 483 on average compared with 105 among medium companies.

Large-company sites also have many more individual Mac networks than medium sites — 31 networks on average per site vs. six. However, the proportion of these networks that are connected with each other is the same — two in three — for both groups.

Ninety-four percent of large sites




*Base: Total respondents*




*Base: Total respondents*

### *Methodology*

*MacWEEK's 1993 Networking Study queried by mail 1,000 MacWEEK subscribers randomly selected from those sites with 50 or more Macs. Value-added resellers, resellers, computer consultants and sites outside the contiguous United States were excluded from the sample. Market Probe International Inc., an independent New York-based market research company, conducted the survey by mail between October and December 1992 using established market research standards. The survey yielded a 56 percent response rate.*

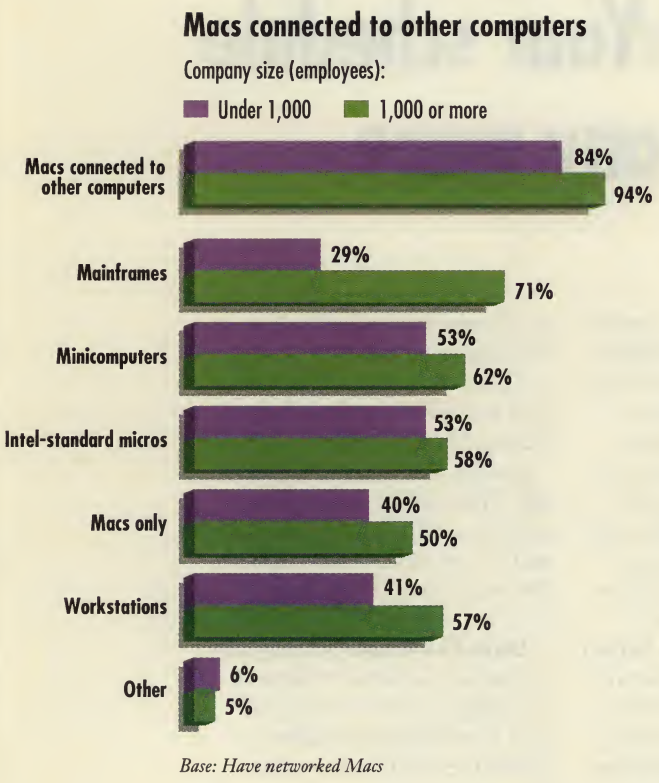
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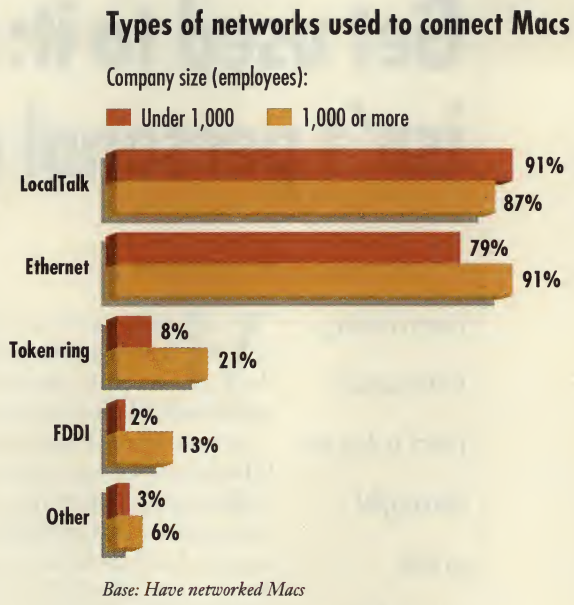
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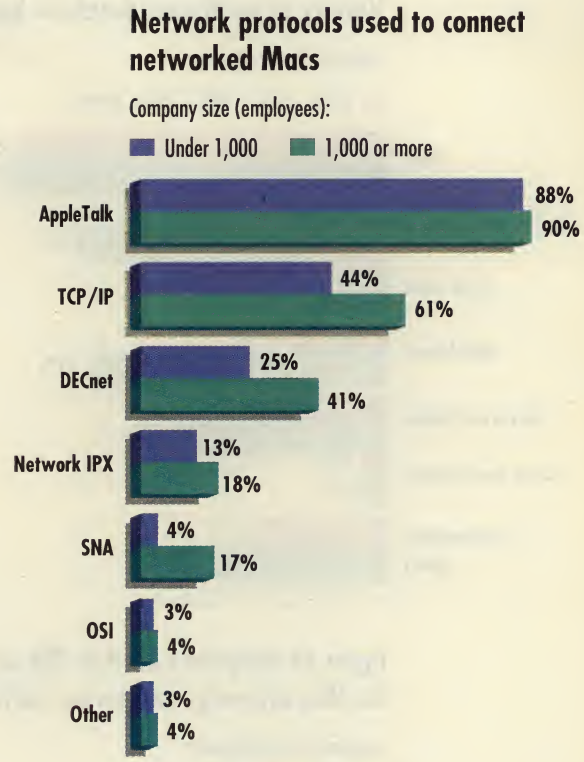
CHARTS BY KEVIN BERGER




*Base: Have networked Macs*




*Base: Have networked Macs*




*Base: Have networked Macs*

surveyed and 84 percent of medium sites have Macs connected to other computer types. But the average large company's Macs are more likely than a medium-size company's Macs to be networked to a greater variety of computers, such as mainframes, minicomputers and workstations.

And only 6 percent of large sites harbor Mac-only networks compared with 15 percent of medium-size companies.

Token-ring and Fiber Distributed Data Interface (FDDI) networks are found primarily at larger sites, a result that fits with the overall complexity and performance needs reported by these companies. In fact, the Mac's built-in LocalTalk still leads Ethernet at medium-size company sites, while Ethernet edges out LocalTalk at the large sites.

> Virtually all respondents report that they use file servers on Mac networks.

Computer Age Inc., an Annandale, Va., computer dealer that serves mostly smaller-size companies reports that its customers still use mostly LocalTalk because it's built into even the lowliest Classic. A local doctor's office recently bought $20,000 worth of Mac equipment, with LocalTalk providing all the connections, which is typical of these sites, the dealer said.

The California Department of Motor Vehicles sees LocalTalk as a "pathway" rather than a final topology. Although the department recognizes that Ethernet, token-ring and fiber all have more bandwidth than LocalTalk, "We're waiting for industry standards to emerge," before upgrading, said Paul Acuna, a technical manager at DMV headquarters in Sacramento.

"In the meantime, LocalTalk is fairly inexpensive, and we can exploit capabilities such as electronic management and support at different levels. LocalTalk is a way to bring Macs into the fold," Acuna said.

Interestingly, while large sites are more likely to have intelligent networking devices, network modems can be found more often at medium sites, perhaps because these sites use them to connect remote networks without the costly investment in switched 56 or T1 lines.

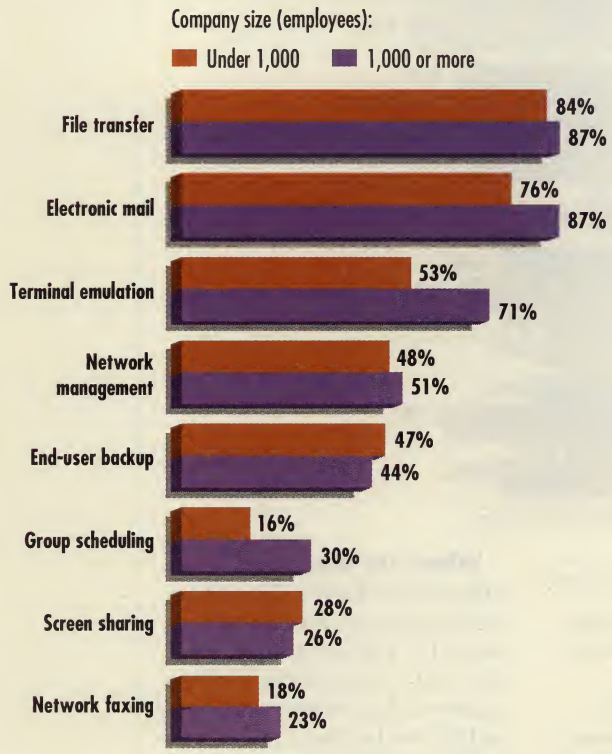
California's DMV uses network modems for remote access by telecommuters and employees at its small satellite offices.

***Parlez vous* TCP/IP?** Both sizes of network sites surveyed use multiple network protocols over their multi-media networks, with AppleTalk dominating.

The reported use of TCP/IP and DECnet protocols at medium-size company sites, although below that at large sites, is notable. However, a higher percentage of big sites use more non-AppleTalk protocols to connect their Macs to the network. TCP/IP, DECnet and especially IBM Corp.'s Systems Network Architecture are used with substantially more frequency at large sites.

It follows, then, that more large sites also run terminal emulators and file transfer packages.

The University of Southern California in Los Angeles is typical of a larger site. Among its 5,000 total network nodes on campus, the 2,000 Macs can handle both AppleTalk and TCP/IP, which is used with terminal-emulation software to connect users to the Internet.




*Base: Have networked Macs*

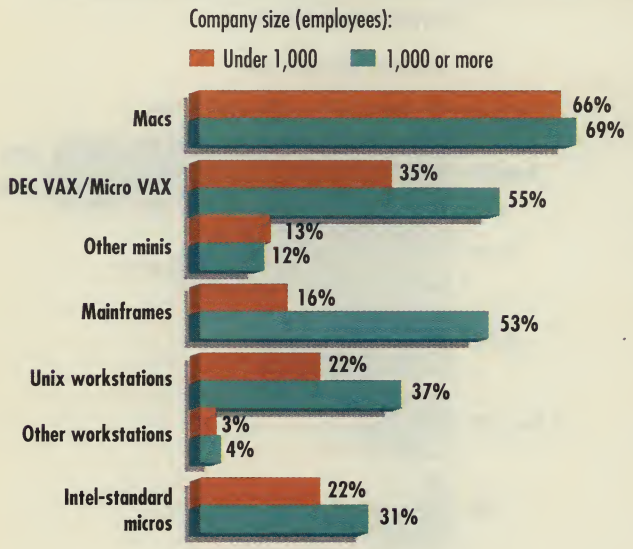
**Software and servers.** Respondents from large-company sites are more likely to be using groupware packages, including electronic mail, network faxing and — at nearly twice the rate of smaller companies — group scheduling. However, equal percentages of sites in both categories plan to install groupware packages in the coming 12 months.

Network administration and backup software are found with about equal frequency, regardless of company size.

Three in five respondents, irrespective of company size, report that Macs are used to access multi-user databases across networks. Contrary to oft-voiced complaints about the suitability of Macs as database

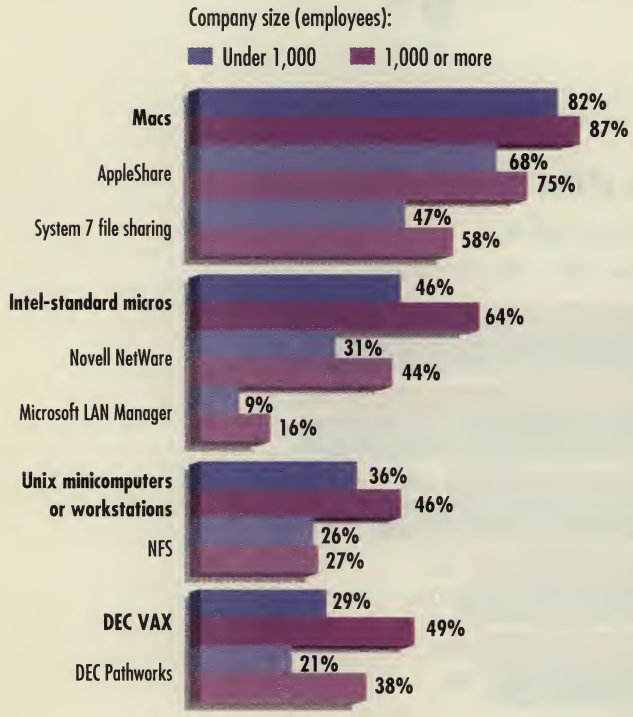
*See Company size, next page*

### Variety of multi-user database hosts




*Base: Have multi-user databases*

### Types of computers used as file servers for Mac networks and server software




*Base: Have networked Macs*

## Company size *From previous page*

servers, it was the Macintosh that these companies used most often as networked database servers.

For example, Hanover, N.H.-based Dartmouth College Information System (DCIS) provides campuswide information resources on-line, including the library's catalog, a rich-text edition of the Oxford English Dictionary that is updated monthly, specialized databases and many other services. The DCIS databases run on AppleShare servers.

Virtually all respondents report that they use file servers on Macintosh networks, with the most popularly cited types consisting of Macs servers running AppleShare, followed by System 7 file sharing. But large company sites are much more likely than medium sites to choose Intel-standard servers running Novell Inc.'s NetWare to service their Mac users.

**Where the bucks are.** Large sites are more likely to be considering the purchase of token-ring cards. The California DMV decided to add a token-ring backbone to a network that already incorporated an Ethernet backbone, and now the DMV is working to integrate its Macs into the token-ring network.

"The biggest headache is deciding what sort of printers to use," Acuna said. "There are no TokenTalk printers," he said, meaning that the Macs cannot print directly to printers on token ring. Currently, Mac printing jobs must be routed to LocalTalk printers.

When asked to predict future computer purchases for the coming year, large company sites were more likely than medium sites to plan on installing additional computer and network equipment in every category except modems, Mac hubs and certain network software, MacWEEK found. □

# Get used to it: Your schedule isn't personal any more

By Larry Stevens

*Overcoming habits and fears is key to successful group scheduling.*

Making the switch to group scheduling means taking on both the human factors and the technological challenges.

As more Mac networks adopt Ethernet and software grows more sophisticated, there are more efficient means of sharing the data once contained in those leather-bound books tucked in pockets and purses.

While the technology hasn't entirely risen to the occasion, human behavior may have even further to go, according to groups who have made the switch from personal calendars to network-based schedulers.

Habits, training, even fears and administrative mandates, can often stymie efforts at sharing schedules.

**Switch and fight.** NeuroScience Inc., a biotechnology company in Cambridge, Mass., for years has had a DEC VAX-based network for scientific operations and Macs for most business functions. So when 70 employees wanted to network their schedules, they decided to use Macs.

"Using the Macs [instead of the VAX] for scheduling is less expensive and more flexible in terms of selecting software," said Mark Schnegg, NeuroScience IS manager. "And training time is virtually nil."

NeuroScience's network includes QuickMail from CE Software Inc. of West Des Moines, Iowa, and Meeting Maker from ON Technology Inc., also of Cambridge.

Meeting Maker is used to plan conferences with people both inside and outside the company. An assistant can access and block out times in other workers' calendars for outside appointments.

"The process eliminates a lot of time spent tracking down people," Schnegg said.

And his users seem to be sold, too. They took to the software enthusiastically, but they stumbled on this new mode of divvying up their previously private days.

**Days like these.** Schnegg said one problem was that while users were diligent about blocking off time for meetings, they did not think to reserve time to work on their own projects.

"Someone may have a project due by 2 p.m. one day, and suddenly he finds that his entire morning is blocked off for meetings," Schnegg said.

Sales and creative account executives at advertising company A. Francis and Associates Inc. of Grand Rapids, Mich., also had some difficulty getting used to the administration of networked scheduling software. The initial 13 Meeting Maker users at the company began planning meetings by reserving blocks of time in each other's schedules. But many users forgot to reserve travel time.

As a result, according to account executive Stan Barnes, "We'd sometimes find ourselves with 10 minutes to travel to a meeting that was half an hour away."

In both companies, users simply had to learn through bad experience that if they wanted time, even their own, they had to block it off. "It was just a different mind-set we had to get used to," Barnes said.

*See Schedule, next page*




J. SCOTT CAMPBELL

Case Study

# NET links company with groupware

By Jeff Ubois

*One high-tech company uses multiple groupware packages for different needs.*

Back when groupware was a new buzzword, pundits predicted this upcoming class of products would be the Swiss army knife of software, but the reality has turned out to be quite the contrary.

Now that networks have advanced enough to support real groupware applications, users are beginning to see more special-purpose tools and fewer ambitious (and pricey) one-application-fits-all products, such as Lotus Development Corp.'s Notes.

That has led groupware-using companies, such as Network Equipment Technologies Inc. of Redwood City, Calif., to adopt more than one groupware package and tailor applications to fit user needs more closely.

Kris Hayes, user support specialist at NET, uses a combination of PacerForum from Pacer Software Inc. of La Jolla, Calif.; Meeting Maker from ON Technology Inc. of Cambridge, Mass.; and QuickMail from CE Software Inc. of West Des Moines, Iowa., to enhance communications within the company.

Hayes' experimentation leads her to praise the effects of groupware in her organization, but she worries about the lack of cross-platform support and the inability of most packages to communicate effectively with software from other vendors, even on the same platform.

**Pacing colleagues.** At NET, PacerForum acts mainly as a bulletin board with distributed discussion groups. It's used to post corporate announcements, tips and techniques for Mac hardware and software, freeware programs, training-facility schedules, information downloaded from Internet mailing lists, and the company stock price. It is also beginning to carry information previously distributed only through voice-mail broadcasts, Hayes said.

The PacerForum board is available to all NET employees, including those in overseas offices. Because all employees can see the same information and comment on it, "PacerForum is letting everybody feel more like one company," Hayes said. "We get dialogues going between people who might never talk to each other otherwise."



JAMIE TANAKA

**Kris Hayes, user support specialist at Network Equipment Technologies, uses PacerForum, Meeting Maker and QuickMail to enhance communications within the company and to "make her day."**

That's a distinctly different function from the role of electronic mail, where messages and their replies are directed, often from one individual to another. Not only does PacerForum handle a group discussion more efficiently, Hayes said, but it makes employees feel freer to offer their comments.

So PacerForum is gradually replacing QuickMail as the medium for broadcast messages, leaving the QuickMail server available to do what it does best, one-on-one communications.

"We'll keep broadcasting messages on QuickMail until we're sure everyone is on PacerForum," Hayes said. "But there is a lot that used to be broadcast on QuickMail that is now on PacerForum, and that is a real load off the QuickMail servers."

PacerForum runs on a dedicated Mac Quadra 950 attached to the company's Ethernet backbone, giving 550 of the company's 800-plus Mac users access.

On the other hand, Meeting Maker, NET's third groupware application, is used at a departmental level, mainly to coordinate personal schedules.

"Ultimately, we'd like to have everyone on Meeting Maker and be able to schedule equipment and people worldwide," Hayes said.

If PacerForum is mainly replacing QuickMail broadcasts, Meeting Maker replaces phone calls and private messages, which normally swirl around the LANs and voice-mail boxes, to get a group of people in one place at one time. "One of the handiest things about Meeting Maker is having it find a time when a group of people are free to get together," Hayes said.

Some NET departments are experimenting with other calendaring programs, such as Now Up-to-Date from Now Software Inc. of Portland, Ore., and Calendar-Maker from CE Software.

**Cross-platform blues.** Like 91 percent of networked sites in the survey, NET's network isn't purebred Macintosh. And when it comes to groupware, diversity spells trouble.

NET's network includes IBM PCs and compatibles and Unix workstations, including Sun SPARCstations and Mac Quadras running A/UX. In an environment like this, making cross-platform connections is a necessity. Unfortunately, like many groupware programs, PacerForum, Meeting Maker and QuickMail have problems accommodating NET's mix of Unix, DOS and Windows machines.

*See Groupware, Page 27*

## Schedule

*From previous page*

**Resistance and roadblocks.** Some users never overcome their reluctance to shared planning, and they often find support for their resistance at the top of the company organizational chart.

Diane Achman, microcomputer support specialist at McDonnell Douglas Corp. in Huntington Beach, Calif., said that few of the 8,000 networked Mac users at her company are willing to give up their paper calendars in return for Schedule+, a Microsoft Mail add-on from Microsoft Corp. of Redmond, Wash.

McDonnell Douglas has had a Mac network since the mid-1980s and Microsoft Mail since about 1990. Unfortunately, Schedule+ was introduced shortly after the company had a corporatewide time-management training program that featured a particular type of paper diary.

"People were just getting warmed up to their paper diaries," Achman said. "But I still thought once they saw the advantages of networked scheduling, they'd flock to Schedule+. But I was wrong."

Achman said she would like to push for a corporate policy mandating, or at least strongly encouraging, the use of Schedule+. However, that plan is on hold because the company recently outsourced to IBM Corp. the management of all computers and networks, and no changes related to microcomputer technology will be considered in the near term.

Sometimes the problem with group-scheduling packages is technical rather than cultural. Many group schedulers today work only on one operating system, which can vastly improve coordination in one group while leaving another entirely out of the loop.

"We'd love to have everyone in the company tied into Easy Alarms [from Essential Software Inc. of Staatsburg, N.Y.]," said Brian Spears, personal computer support analyst at DeLong Sportswear Inc. of Grinnel, Iowa. "But we have a number of different networks, and the software doesn't run across [multiple] networks so far."

The company has several interconnected LocalTalk networks, and so far Easy Alarms is used by only 11 people on one LAN. "The MIS manager would love to be able to schedule meetings using Easy Alarms with other project leaders, but since he's on a different network than most business managers, he can't. As a result, he doesn't see any reason to install Easy Alarms," Spears said.

**Network for scheduling.** Managers often find that scheduling software is best used when the network is developed specifically for it and management mandates its use.

The athletic department at Boston College recently installed a network specifically to tie together scheduling software. John Kane, assistant athletic director of operations, said the staff has to schedule facilities and events for 32 varsity teams, including ice hockey, basketball, football, swimming, tennis and track.

"[Scheduling] with paper, pencil and charts was very difficult since so many different people had to be involved in the sessions," he said.

To solve the problem, the athletic department tied its 30 Macs to a network that runs AgentDA from TeamBuilding Technologies Inc. of Montreal. The software gives Kane access to the schedules of all the coaches, trainers and directors. "I can see on my computer where everyone will be at any time," Kane said. "That makes scheduling much simpler." □

# Ethernet feeds net applications

*Larger Ethernet networks lead to proliferation of network applications.*

By Amanda Iles

Macintosh networks have gotten bigger and faster in the past 15 months. The trend is bringing users to expect more from their LANs as more groupware and client-server applications become available on their desktops.

**The Ethernet grows.** As expected, the 1993 MacWEEK Networking Study found that nearly all respondents at subscriber sites with 50 or more Macs installed use LocalTalk and Ethernet to connect networked Macs. In addition, respondents expect Ethernet usage at their sites to continue growing during the coming year.

In the past 15 months, MacWEEK subscribers have increased both the absolute number and the variety of their network media. The percentage of sites using Ethernet has risen more dramatically than those using LocalTalk, but fewer sites are using either of these network media exclusively. Ethernet has became as widespread as LocalTalk at surveyed sites, while the proportion of sites using LocalTalk exclusively dropped from 14 percent to 9 percent.

Fiber Distributed Data Interface (FDDI) and token-ring usage has remained relatively stable during the past year.

**Dartmouth ready for killer apps.** Dartmouth College in Hanover, N.H., currently connects all its students, faculty and staff to a campuswide network via Ethernet backbones with LocalTalk running to most desktops. LocalTalk connections are provided free; it costs $200 for an Ethernet connection. This media mix works for now, but the college network users and administrators expect that they will soon need to upgrade the network.

"LocalTalk is not good enough for transferring sounds or images over electronic mail," said Rich Brown, manager of special projects for Dartmouth's Computing Services. "Over the next two to three years, users will find 'killer apps' that demand more bandwidth. By that time, we plan to upgrade all users to Ethernet as a standard, free service, just as LocalTalk is offered now."

Ethernet is expected to handle the near-term requirements of many surveyed sites. KMPG Peat Marwick in Montvale, N.J., for example, anticipates that Ethernet will fulfill its networking needs for the next three years or so. The company currently alleviates its network load by using CD-ROMs to distribute most of its multimedia work.

**Ethernet rules, for now.** Nearly all MacWEEK subscriber sites where Macs are networked to other types of computers use Ethernet.

"LocalTalk doesn't work with mixed networks, so we use Ethernet," said Mario Dell'Aera, a senior manager at KMPG Peat Marwick. Similarly, Dow Chemical's Shreveport, Texas, research division has both IBM PCs and compatibles and Macs, and it depends on Ethernet throughout for speed.

While the survey found that Ethernet currently is found at fewer than half of Mac-only network sites, the proportion of these sites using Ethernet is expected to increase dramatically in the next year from 44 percent to 60 percent.

Compared with 15 months ago, significantly more respondents plan to purchase products to migrate to Ethernet. The University of Southern California in Los Angeles, for example, has "a major problem with the bandwidth on LocalTalk," according to Chuck Hellier, a University Computer Services systems analyst.

"We can't store apps on the server and launch them on the desktop because LocalTalk is too slow," he said. "So we download apps to local machines, but we're running out of hard disk space. We could get bigger hard disks, but we plan to buy Ethernet instead."

Compared with Ethernet, planned purchases of token-ring products remain relatively flat and low, cited by 12 percent or less respondents.

**A plurality of groupware.** File transfer and E-mail dominate the types of LAN software used with networked Macs at respondent sites, although a healthy percentage use terminal emulation, network management and backup software. Group scheduling, screen sharing and network faxing remain less common, in use at about one-quarter of the sites surveyed.

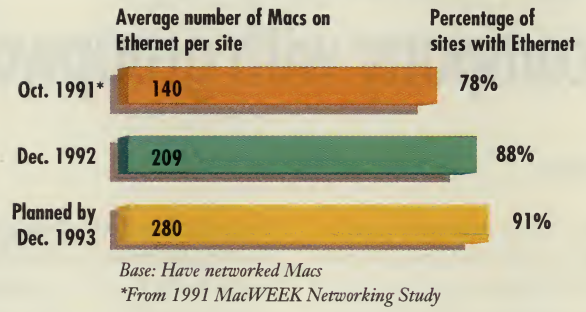
Significantly, however, the proportion of sites planning to use all types of LAN software looks like it's going to bloom. For instance, although only 22 percent of sites surveyed currently use network faxing, 27 percent plan to install it in the next 12 months.

In each category of LAN software that MacWEEK asked about, relatively large percentages of sites planned to install products in the next year. If these expectations manifest themselves as real purchases, the range of networked applications in use will broaden rapidly.

**Beyond Ethernet.** This growth in networked applications is causing some users to look beyond Ethernet's bandwidth. Tony Van Hoos is a technical consultant for Mediawrks in Winona, Minn., and coordinator of a technical team that

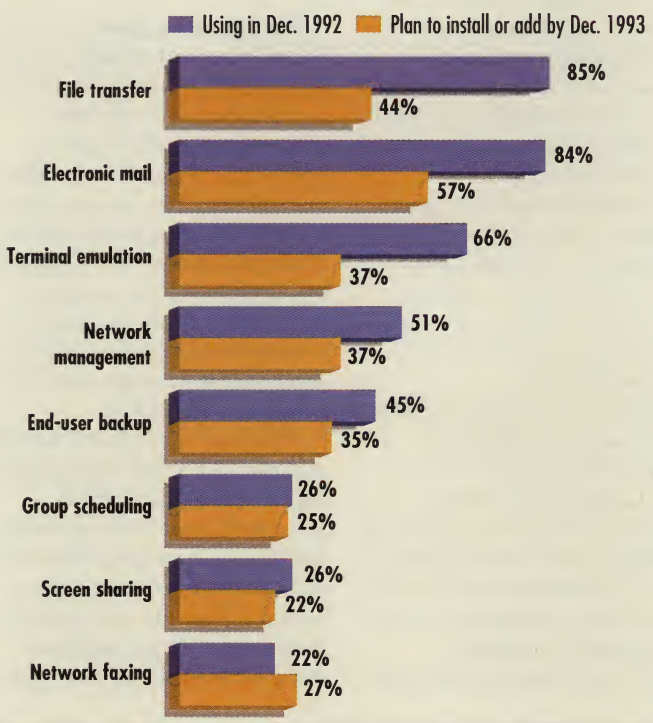
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## Ethernet acceptance and volume growing



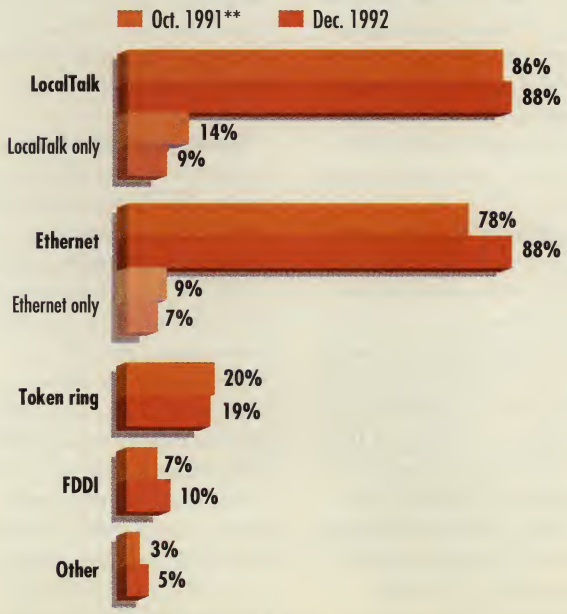

*Base: Have networked Macs*
**From 1991 MacWEEK Networking Study*

## Sophisticated network applications poised for huge growth




*Base: Have networked Macs*

## Use of Ethernet continues to be as widespread as LocalTalk




*Base: Have networked Macs*
***From 1991 MacWEEK Networking Study*

## Groupware

*From Page 25*

"The problem with PacerForum is there is no way for Unix users, even the A/UX users, to get access," Hayes said. "Cross-platform access would be great."

In fact, it may be tough to keep the company from fracturing along platform lines. "I'm a little nervous that bringing together everybody on Macs will have Sun users screaming their heads off," Hayes said.

"In one sense [groupware] is bringing the company together, but in another, it's dividing the company up into Mac vs. Sun," she said.

To make matters worse, none of the three groupware applications she uses is on speaking terms with any other, ruling out the possibility of sharing information. "Being able to post from QuickMail to PacerForum would be useful," Hayes said.

**User acceptance.** The reaction to PacerForum and Meeting Maker at NET has been positive, and users seem to understand the different appeal of each package.

"I like PacerForum because it is quick and easy to learn, and it's a good way to share information with a broad audience," said J. Tony Smith, NET information delivery coordinator.

Smith said that PacerForum's usefulness increased over time as more information was uploaded to it. "It takes some time to break it in — you need a few people dedicated to the idea that this is going to be useful and not just an annoying little bell that goes off every five minutes."

Meeting Maker also drew good reviews. "Being able to look at a calendar, highlight the time you want and see if people are available is a great feature," Smith said.

But the programs have had their drawbacks. "The question is whether you can run [Meeting Maker] as a server from a System 7 machine without it taking up so much memory and CPU time it interrupts your work — and I'm not certain about that yet," Smith said.

One problem with PacerForum, Smith said, was that every new posting rang a loud bell and dropped a large icon into the middle of every user's screen, and that led some people to turn the program off. "I got annoyed enough at the tone that I did a ResEdit hack," Smith said.

**NET wish list.** While PacerForum has been well-received by Hayes and other NET employees, being popular has its price. Hayes said she'd like to see some improvements.

Greater manageability, such as the ability to see how many people are logged on, set a variety of access levels, group topics more effectively and delete old messages automatically, are features Hayes hopes to see in a new release.

"Right now, when you set up accounts, users can either create [bulletin] boards and topics or they can't. They can do everything or nothing," Hayes said. "It would be much more useful if it were possible to set restrictions at the board level, if they could create topics on certain boards but not on others."

An anonymous posting feature would also be useful. "Sometimes someone has something to say but doesn't want a name attached," Hayes said. "Right now, you can't anonymously say anything."

Finally, Hayes said she'd like Pacer to make linking servers together for more horsepower an easier process.

Like most groupware, PacerForum is still far from perfect, but despite the management and cross-platform strains, this class of software is starting to do what it's supposed to: get information flowing to move people on the LAN. □

**Cross-platform sites build bigger Ethernet networks**

| | Mac-to-Mac exclusively | Mac-to-Intel | Mac-to-mini or mainframe | Mac-to-workstation |
|---|---|---|---|---|
| Ethernet currently installed | 44% | 93% | 94% | 97% |
| Avg. number of Macs currently on Ethernet | 55 | 264 | 236 | 249 |
| Ethernet installed by Dec. 1993 | 60% | 95% | 95% | 97% |
| Avg. number of Macs on Ethernet by Dec. 1993 | 113 | 354 | 318 | 349 |

## Ethernet

*From previous page*

designed a large-scale technology implementation at Cotter High School, also in Winona. Cotter uses Ethernet throughout its network.

"Ethernet is definitely the minimum speed we need," Van Hoos said. "We'd actually like something faster, but Ethernet is the only standard we fit into. We're already looking forward to the next standard in networking. The kids are doing lots of work with multimedia using HyperCard and QuickTime video. It starts to eat up the network bandwidth."

Van Hoos said he is unsure what the future networking standard will be, but he speculates it could be Asynchronous Transfer Mode switching networks, Copper Distributed Data Interface or FDDI.

Similarly, even as Dartmouth installs Ethernet to more desktops, Dartmouth Computing Service's Brown expects the traffic eventually will overload the Ethernet backbones.

"We have fiber — FDDI — in mind for the future," Brown said. But his plan is to wait until the current system is overloaded before switching to something new. By waiting, he expects that the cost of the new network will be far less than if the college upgraded in anticipation of overload.

"We call it our just-in-time approach to computer services," Brown said. □

PC TO VAX PC TO UNIX PC TO NETWARE MAC TO VAX MAC TO UNIX MAC TO NETWARE

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MAC TO VAX MAC TO NETWARE PC TO UNIX PC TO VAX PC TO NETWARE MAC TO UNIX

# Painter 2.0 to get object-oriented

*Fractal extension to add new features*

**By Carolyn Said**

Aptos, Calif. — Fractal Design Corp. will soon add the flexibility of object-based editing to Painter 2.0.

"I think this will revolutionize things," said beta-user Daniel Clark, owner of Daniel Clark Design of Glendale, Calif. "This will let designers do photocomposition with multiple images in a fraction of the time that's needed now."

Fractal Design Painter/X2, which the company will ship next month, is a $149 extension for Fractal's $399 natural-media painting application. It adds a variety of new features, including:

▸ **Multiple floating selections.** Painter/X2 lets users save each component of a Painter image in its own layer, where it can then be selected, moved and edited independently.




**Painter/X2 lets users select, move and edit parts of a photographic image. A Floating Selections palette (top left) controls attributes, and a Portfolio (bottom right) lets users store parts of an image.**

Painter/X2 adds a new Pointer tool for controlling floating objects. Users will be able to edit attributes such as transparency, layering priority and feathering of edges, or apply any of Painter's tools and special effects within each layer.

▸ **Editable Sessions.** Painter 2.0 already lets users create Sessions, or scripts, that record user actions for later playback. Painter/X2 will let users edit Sessions in a word processor and apply them to images.

▸ **Color Sets.** Painter/X2 supports multiple Color Sets, or palettes, of named RGB (red, green, blue) colors that can be attached to files. Users will be able to create and edit Color Sets in Painter/X2 or with a text editor. An annotation feature will let users click on a color in an image to create a tag of the color's name. When users change a color, the annotation will change to reflect the new name.

▸ **Multiple independent friskets.** While Painter is limited to one frisket, or mask, per file, Painter/X2

*See Painter/X2, Page 30*

# Clear Choice takes wraps off new BrushStrokes painting app

**By Kirsten L. Parkinson**

Santa Clara, Calif. — Claris Clear Choice this month will ship BrushStrokes, a $139 painting program that offers advanced features such as custom brushes, filters and 3-D effects.

The 32-bit-color program provides a variety of tools and special effects:

▸ **Basic tools.** BrushStrokes comes with tools for drawing circles, squares and polygons; a pencil tool for freehand drawing; paintbrushes; a spray can; and an eraser.

BrushStrokes also will let users rotate, flip, scale or skew an image. A perspective feature simulates 3-D effects by setting images at user-specified angles.

▸ **Effects.** Users will be able to select effects for brush patterns, such as smear, fuzzy, blend, lighten and darken. BrushStrokes will also let users customize the size and shape of brushes.

▸ **Filters.** The program includes eight filters for smoothing, sharpening, embossing and brightening, and adding mosaic effects to images. It also supports selected Adobe Photoshop and Aldus Gallery Effects add-on filters.

▸ **Gradients.** BrushStrokes supports gradient fills. Users will be able to specify the range and order of colors in a fill. The program will also let users apply effects such as sunburst or directional fills to gradients.

Other features include five levels of undo, floating palettes and masking capabilities. BrushStrokes also ships with a collection of clip art.

Through May 31, Clear Choice will offer a $79 trade-in to users of competing products, including Claris' own MacPaint, Aldus SuperPaint, Pixel Resources Inc.'s PixelPaint and Expert Software Inc.'s Expert Color Paint.

Clear Choice, a division of Claris Corp., acquired the application from its developer, Casady & Greene Inc. of Salinas, Calif.

Claris Clear Choice is at 5201 Patrick Henry Drive, Box 58168, Santa Clara, Calif. 95052. Phone (408) 727-8227. □



**Filters were applied to the inside of this star to blur it. BrushStrokes offers eight filters for manipulation.**

# ScanMatch in step with ColorSync

**By Matthew Rothenberg**

San Francisco — Savitar Inc. this month will deliver a ColorSync-compatible upgrade to ScanMatch, the company's scanner-calibration software.

Like the original program, ScanMatch 2.0 converts scanner RGB (red, green, blue) data to monitor RGB via an intermediary CIE color space, and it ships with a color target developed jointly with Pantone Inc. of Moonachie, N.J. (see MacWEEK, Nov. 19, 1991).

In addition, Version 2.0 creates device profiles that are compatible with ColorSync, Apple's new system-level architecture for device-independent color. A software plug-in bundled with ScanMatch 2.0 lets users apply calibration from within Adobe Photoshop.

The upgrade calibrates all flatbed scanners, and users will be able to buy transparent targets that let them calibrate slide scanners.

ScanMatch 2.0 will ship for $199 with one Pantone target and the ColorSync extension, a $50 increase from the previous version. Upgrades from the original version will be $49, additional reflective and transparent calibration targets will range from $99 to $199 each, and Photoshop plug-ins designed to output calibrated images to specific printers will cost $99 each.

Savitar Inc. is at 139 Townsend St., Suite 203, San Francisco, Calif. 94107. Phone (415) 243-3030; fax (415) 243-3080. □




**ScanMatch 2.0's scanner profiles work with Apple's ColorSync to provide device-independent color.**

# Kodak cuts continuous-tone color down to size

*Low-cost printer handles 4x5 prints*

**By Matthew Rothenberg**

Rochester, N.Y. — Eastman Kodak Co. this week released a compact dye-thermal device that cuts the cost of generating continuous-tone 4-by-5-inch color prints.

The Kodak 450GL, available for $1,729 in a Macintosh configuration, weighs 18 pounds and measures 3.7 by 16.9 by 14 inches.

The QuickDraw device is based on a proprietary engine. It outputs eight bits each of CMY (cyan, magenta, yellow) or gray-scale data per pixel to special thermal paper and handles images measuring up to 3.94 by 5.51 inches. Photos take about 45 seconds to process and 45 seconds to print and cost about 90 cents each, Kodak said.

The Mac version of the printer ships with a NuBus card for connecting its Centronics parallel port. The 450GL also includes a proprietary look-up table for Photo CD images.

Kodak said the printer is suited for tasks such as generating comps for industrial and textile design, creating photo archives for insurance claims and art collections, and printing security badges.

Kodak also announced a low-cost Adobe Level 2 dye-sublimation printer at last month's CeBIT '93 show in Hanover, Germany. The Kodak ColorEase PS Drucker outputs continuous-tone, 300-dpi A4-size images in a little more than three minutes. It includes simultaneously active LocalTalk, serial and parallel interfaces; Ethernet is optional. The printer also comes with 16 Mbytes of RAM, expandable to 32 Mbytes, and a 120-Mbyte hard disk.

The ColorEase PS is available in Europe for about $8,000; Kodak declined to comment on plans to distribute the printer in the United States.

Eastman Kodak Co. is at 343 State St., Rochester, N.Y. 14650. Phone (716) 724-4000 or (800) 344-0006. □

# IT DOESN'T TAKE A ROCKET SCIENTIST TO FIGURE OUT WHICH 24-BIT COLOR GRAPHICS CARDS ARE THE FASTEST.

**MacWEEK** Reprinted From January 13, 1992

BENCHMARKS

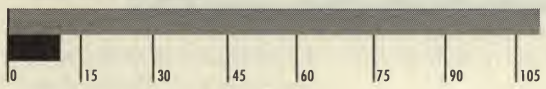
**Hydra composite tests**
**(Results in ticks; lower is better)**

RasterOps 24XLi
SuperMac Thunder/24

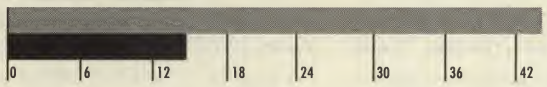
**Unaccelerated 24-bit mode**




**Accelerated 24-bit mode**




**Accelerated 8-bit mode**




*All tests were run on a Mac IIfx under System 7.0.1 with 20 Mbytes of RAM and with 32-bit addressing on. Hydra times are in ticks (1/60th of a second).*

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February 1993

MW LAB

## Gauging Video Speed

**REAL-WORLD TESTS**

In our real-world tests, the size of the monitor dramatically affects performance for line scrolls: bigger monitors are slower. However, bigger monitors can have an advantage for page scrolls, where all the data on the new page is moved onto the screen in one step. Scrolls are good tests of actual performance because they are common tasks and because they cause the Mac to redraw a range of objects, from text to graphics.

**LOW-LEVEL QUICKDRAW TESTS**

Low-level tests of QuickDraw command processing show theoretical best performance. The Basic Commands group includes QuickDraw commands that all vendors accelerate. Radius and SuperMac accelerate some other commands, but our tests show that this does not change these boards' performance.

| | Vertical Scroll (in seconds) | Horizontal Scroll (in seconds) | Page Scroll (in seconds) | All Commands (speed compared to Apple 8•24) | Basic Commands (speed compared to Apple 8•24) |
|---|---|---|---|---|---|
| Products are ranked in overall performance order, from fastest to slowest, within each monitor size category. The best in each category is indicated in red. | Average results for a series of up and down scrolls (one line at a time) in Excel and Word documents. | Average results for a series of left and right scrolls (one column at a time) in Excel documents. | Average results for a series of up and down scrolls (one screen at a time) in Word documents. | Relative performance in processing all 118 QuickDraw commands, using the industry-standard Hydra benchmark. | Relative performance in processing 25 common QuickDraw commands, using the industry-standard Hydra benchmark. |
| With 19-inch Monitors | | | | | |
| SuperMac Thunder/24 | 27.9 | 26.5 | 7.8 | 3390% | 890% |
| SuperMac Spectrum/24 PDQ Plus | 37.1 | 30.8 | 8.0 | 1670% | 510% |
| SuperMac Spectrum/24 Series III* | 54.2 | 40.7 | 8.7 | 710% | 280% |
| Radius PrecisionColor 24Xk | 61.9 | 84.7 | 14.3 | 600% | 270% |
| RasterOps 24XLI | 74.2 | 59.3 | 15.3 | 380% | 180% |
| Radius PrecisionColor 24X | 62.9 | 85.5 | 14.3 | 600% | 270% |
| With $499 piggyback board installed | Shorter bars are better. | Shorter bars are better. | Shorter bars are better. | Longer bars are better. | Longer bars are better. |

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MacUser

## Figure 1: Speed Results

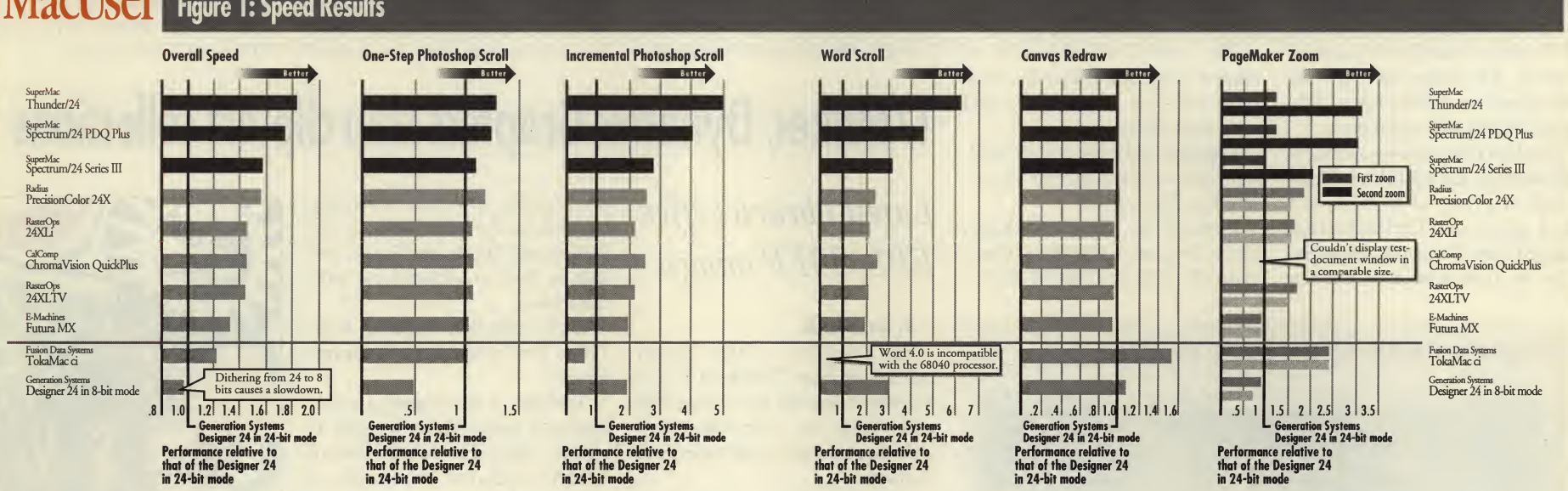



**Figure 1:**
To find out if an accelerated-video cord can improve the performance of some popular applications, we performed a suite of real-world tests. We ran all tests on the same Mac IIci connected to the same monitor. We compared the results with those of a Generation Systems Designer 24 unaccelerated-video cord in 24-bit mode. We also subjected the Designer 24 to the same tests in 8-bit mode and repeated the tests with a Fusion Data Systems TokaMac ci to see the effect of CPU acceleration.

**Overall Speed:**
The SuperMac Thunder/24 and Spectrum/24 PDQ Plus were fastest overall, almost doubling the speed of the Designer 24 unaccelerated-video cord in 24-bit mode.

**One-Step Photoshop Scroll:**
Many users of 24-bit color frequently use Photoshop, so we scrolled through some 24-bit Photoshop images to see if the accelerated-video cards could beat our control product. The Thunder/24 was 25 percent faster than the unaccelerated-video card, and the TokaMac ci CPU accelerator offered no improvement at all.

**Incremental Photoshop Scroll:**
In the incremental scroll, SuperMac's Thunder/24 was five times as fast as the unaccelerated-video card. The TokaMac ci was actually 40 percent slower.

**Word Scroll:**
To see if Word users stand to gain anything from video acceleration, we scrolled through a ten-page text document and found that the SuperMac Thunder/24 was more than six times as fast as the Designer 24. The SuperMac Spectrum/24 PDQ Plus came in a close second, and all the other cards were about twice as fast as the unaccelerated card. As 24-bit color seems a waste for Word users, we ran the same test on the Designer 24 in 8-bit mode and found that it was nearly three times as fast as in 24-bit mode, beating the majority of the accelerated-24-bit cards. We could not run the test with the TokaMac ci, because Word 4.0 is incompatible with the TokaMac ci's 68040 processor.

**Canvas Redraw:**
We were surprised to find that the accelerated-video cards did nothing to speed up a Canvas redraw. The one product that really helped in this task was the TokaMac ci, providing that this task was primarily a compute-intensive one, a task for which video accelerators are not well suited.

**PageMaker Zoom:**
Finally, we zoomed out to a 100-percent view from a 400-percent view of a PageMaker document consisting of text and a 24-bit-color image. We then repeated the same test to see if the cards were caching any of the video data. All the accelerated-video cards, with the exception of the Radius PrecisionColor 24X and the two RasterOps cards, performed the second zoom much faster than they did the first. The Designer 24 card was slower in 8-bit mode than it was in 24-bit mode because the 24-bit graphic had to be dithered for the 8-bit display.

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The Hydra QuickDraw™ performance test has become the standard for evaluating the speed of 24-bit color graphics cards. As you can see, Thunder/24,™ Spectrum/24 PDQ Plus,™ and Spectrum/24 Series III™ outperform all the other 24-bit color graphics cards on the market.

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# Logitech boosts resolution of FotoMan digital camera

By Neil McManus

Fremont, Calif. — Logitech Inc. is developing a higher-resolution version of its FotoMan digital camera.

Like its predecessor, FotoMan Plus captures eight-bit gray-scale photos that can be downloaded to the Mac via a serial interface and bundled cable. The new version, due next month for $799, offers a resolution of 496 by 360 pixels, a 67 percent increase over FotoMan's 376-by-284-pixel resolution.

The higher resolution is possible because FotoMan Plus uses JFIF (JPEG File Interchange Format) protocol to compress images at a ratio of 8-to-1, Logitech said. Like the original FotoMan, the new camera stores up to 32 gray-scale images in its 1-Mbyte dynamic RAM buffer.

After compressed FotoMan Plus images are transferred to the user's Mac, a bundled Adobe Photoshop plug-in will decompress the images and give users thumbnail previews of all the photos stored in the camera's memory. The device will also come with Aldus Corp.'s $395 Digital Darkroom 2.0 image-editing program.

FotoMan Plus measures a subject's reflectiveness and regulates its built-in flash at a range of 16 inches to 6 feet, Logitech said. The lens has been changed from 55mm to 65mm to improve its zoom capabilities, and new code in the camera's ROM provides gamma correction and sharpening.



Logitech's FotoMan Plus digital camera captures up to 32 eight-bit gray-scale photos, which can be transferred to the Mac through a serial cable.

The camera will ship with an adapter ring that will let users attach camcorder-size 37mm macro and wide-angle lenses.

Logitech will offer a $249 hardware and software upgrade to current FotoMan users.

Logitech Inc. is at 6505 Kaiser Drive, Fremont, Calif. 94555. Phone (510) 795-8500; fax (510) 792-8901. □

## MOVIEWORKS LAUNCHES PLAYER




San Mateo, Calif. — Interactive Solutions Inc. last month released a run-time player for MovieWorks, its QuickTime-based presentation program.

MovieWorks Player is free to registered users and can be freely distributed.

MovieWorks consists of integrated modules for editing text, sound and images and consolidating the results into an animated presentation, such as the one shown above. Multiple presentations can be linked in sequence or interactively through buttons. Ordinarily $395, MovieWorks is $195 until June 1.

Interactive Solutions Inc. is at 1720 S. Amphlett Blvd., Suite 219, San Mateo, Calif. 94402. Phone (415) 377-0136; fax (415) 377-1964.

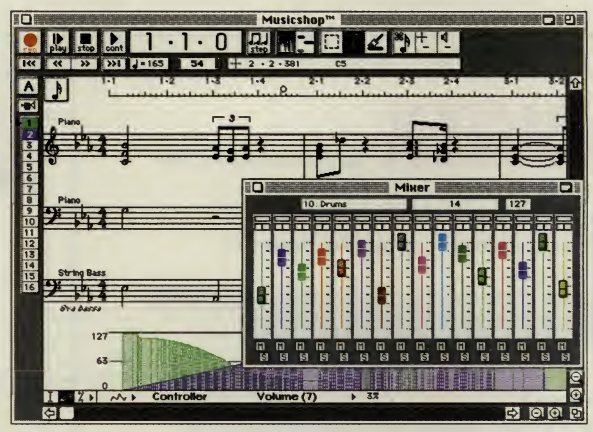
# Opcode opens Musicshop for Mac music editing

## *Turns MIDI tracks into sheet music*

By Kirsten L. Parkinson

Palo Alto, Calif. — Opcode Systems Inc. is trumpeting Musicshop, a new program that turns MIDI tracks into sheet music.

Available now for $149.95, Musicshop lets users record MIDI (Musical Instrument Digital Interface) tracks and view them as either piano rolls or musical notation.




Musicshop, a low-end MIDI recording and editing program from Opcode Systems, includes a mixing feature and music-notation views.

The musical-notation view supports simple editing, such as changing the pitch of a note, and printing. A Page Preview window lets users add titles, tempo markings and composers' names to the music before printing.

In the piano-roll view, users can do more-complex editing, including precise adjustment of a pitch, a change in rhythm or the addition of details such as vibratos.

The program also includes a mixing feature and a tape deck-style interface that supports 16 tracks for controlling MIDI recording and playback.

"The nice thing about [Musicshop] is that it doesn't get in the way of your creative process," said Roger Jordan, an amateur musician in Austin, Texas. "Vision (Opcode's MIDI sequencing program) has so many features that by the time you get everything figured out, you've lost your creative spark."

Beta-tester Jack Fishman, CEO of MacBeat Inc. of Santa Fe, N.M., said: "Musicshop interprets MIDI data with such accuracy that it gives the musician a clear idea of how the music will look when notated. The program incorporates the ease of use with which EZ Vision (Opcode's low-end MIDI sequencing program) has long been heralded with a very clear and simple notation interface."

EZ Vision users can upgrade to Musicshop for $49.95. Opcode also cut the price of EZ Vision from $149.95 to $99.95.

Opcode Systems Inc. is at 3950 Fabian Way, Suite 100, Palo Alto, Calif. 94303. Phone (415) 856-3333; fax (415) 856-3332. □

# T/Maker, Dynamic Graphics ship clip-art collections

## *Latest libraries offer EPS, TIFF images*

By Ian G. Jacobs

San Francisco — New clip-art collections from T/Maker Co. and Dynamic Graphics Inc. will let Mac users dress up their documents with themes that include sports and business.

▸ **T/Maker** has replaced its black-and-white ClickArt EPS clip-art libraries with 16-bit-color versions. Each collection in the new ClickArt Studio Series costs $99.95, a $30 reduction from the price of the black-and-white libraries. Users of the previous collections can upgrade for $19.95 each.

The Business Art, Illustrations, and Artistry and Borders collections are available now. The remaining two disks in the series, Animals and Nature, and Sports and Games, will ship in their colorized form later this month.

Each collection contains from 150 to 325 Encapsulated PostScript images.

T/Maker is also shipping a collection of images culled from all its clip-art disks. The $24.95 Best of ClickArt includes 100 images of cartoons, business drawings and animals in EPS, PICT2 and Paint formats.

▸ **Dynamic Graphics** last month shipped four collections of black-and-white EPS and TIFF clip art.

The series, called ArtAbout, covers such topics as sports, health care, food and seasons. Each $129 disk contains more than 100 images.

T/Maker Co. is at 1390 Villa St., Mountain View, Calif. 94041. Phone (415) 962-0195 or (800) 955-1750; fax (415) 962-0201.



These images are in T/Maker's ClickArt EPS Artistry and Borders collection.

Dynamic Graphics Inc. is at 6000 N. Forest Park Drive, Peoria, Ill. 61656. Phone (309) 688-8800 or (800) 255-8800; fax (309) 688-3075. □

## Painter/X2

*From Page 28*

will let users control an unlimited number of friskets for each image. "Being able to edit masks on the fly increases productivity tremendously," Clark said.

▸ **Portfolios.** Painter/X2 offers libraries of visual images called Portfolios. Users will able to drag images into a Portfolio and name them; a thumbnail view is created for easy identification. Users will be able to create multiple Portfolios but open only one at a time.

▸ **Speed improvements.** Painter/X2 will capture 104 samples per second from graphics tablets, up from 60 in Painter 2.0. Fractal said Painter/X2 will incorporate other speed enhancements as well.

According to the company, many of Painter/X2's new features will be incorporated into Version 3.0 of ColorStudio, Fractal's $795 color image-editing program, which it hopes to introduce in August.

Fractal also plans to release a new library of flora and fauna paper textures next month. It will be priced similarly to the company's current libraries, which cost $29.95 each.

Fractal Design Corp. is at 335 Spreckels Drive, Suite F, Aptos, Calif. 95003. Phone (408) 688-5300; fax (408) 688-8836. □

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|---|---|---|---|---|
| PostScript Level 2 | **YES** | Yes | Yes | No |
| AppleTalk | **YES** | Yes | Yes | No |
| Resident PostScript Fonts | **17** | 35 | 35 | 13 |
| Simultaneously Active Ports | **YES** | No | Yes | No |
| List Price | **$1,199** | $1,895 | $1,695 | $1,079 |

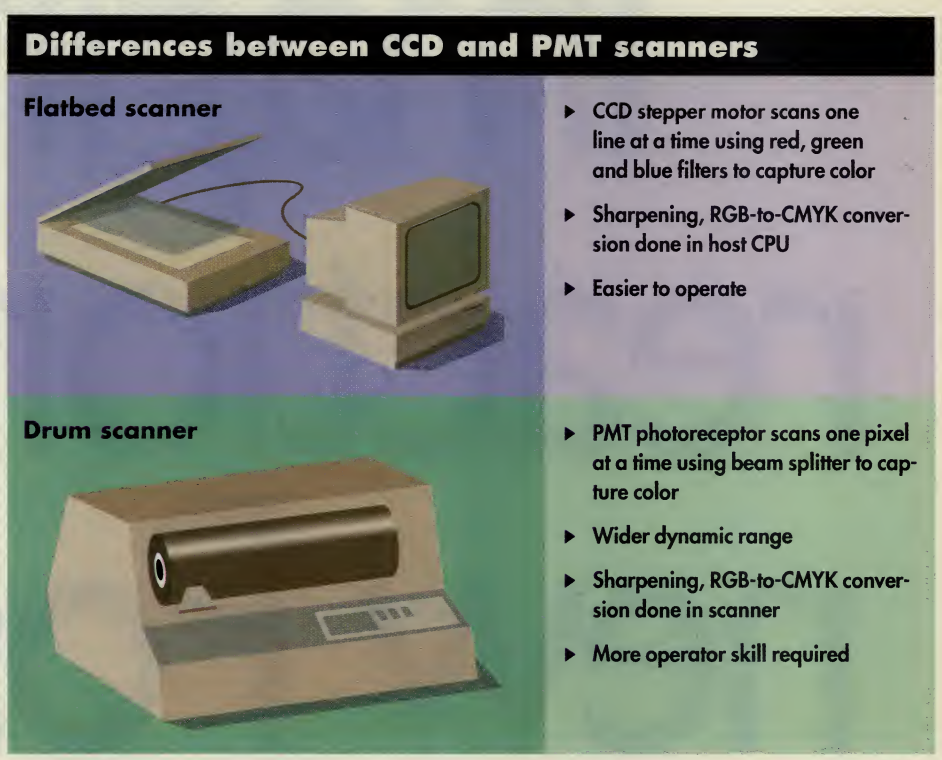
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Special Report

# Array of scanning options, innovations confront users

*While much excitement has been generated by the advent of Eastman Kodak Co.'s Photo CD and by the introduction of digital cameras from Kodak, Leaf Systems Inc. and others (see MacWEEK, Feb. 15), the vast majority of images that make their way onto disk get there via a scanner. In this Special Report, we examine current scanner technology and talk to users who are putting this technology to work.*




NEVIN BERGER

## Scanner technology improving

By Bruce Fraser

***More power and features bring the quality of CCD-based scanner output closer to that of high-end PMT-based devices.***

There are three types of scanners available: drum scanners, which use photomultiplier tubes as photoreceptors, and flatbed and slide scanners, which use CCDs as photoreceptors.

Conventional wisdom has it that drum scanners provide superior quality over CCD-based devices, and in the past this has certainly been true, although the gap is beginning to narrow.




**Drum scanners.** Drum scanners, which still dominate the pre-press industry, have been around for much longer than desktop computers; originally, they were used to image color-separated halftones directly onto film. As color pre-press workstations became more affordable, analog-to-digital converters were added to drum scanners, allowing them to output digital image data to workstations for electronic stripping into the complete page. Nowadays most drum scanners offer some kind of link to the Macintosh. Vendors that offer Mac-compatible drum scanners include Danagraf North America Inc., Linotype-Hell Co., Optronics, Howtek Inc., Crosfield Lightspeed and Screen USA.

In a drum scanner, original artwork is mounted on a drum, which then rotates rapidly beneath a stationary light source and tube-based photoreceptors known as photomultiplier tubes (PMTs). A beam splitter is used to split the light reflected from the original into its RGB (red, green, blue) components, and the amount of each component is read by the appropriate PMT.

The analog signals from the PMTs are then converted to digital data and fed to on-board color computers that perform RGB-to-CMYK (cyan, magenta, yellow, black) conversion. Drum scanners also perform sharpening, usually through some form of unsharp masking, which may be done either optically, using a fourth PMT, or electronically, using algorithms. The output is a digital CMYK file, either in a proprietary format, such as Scitex CT, or increasingly as Encapsulated PostScript or TIFF.

**Flatbed scanners.** Flatbed scanners, which are generally much cheaper than drum scanners, use CCDs (charge-coupled devices) as photoreceptors. They use a linear CCD array, with individual photoreceptors arranged in a strip.

The resolution of the scanner in one direction is determined by the number of photoreceptors per linear inch in the array: Most desktop flatbeds have 300, 400 or 600 photoreceptors per inch. The scanning head, which contains the light source and the CCD array, is moved over the target image by a stepper motor, and the number of steps per inch determines the resolution of the scanner in the other direction. This is why so many flatbed scanners have asymmetrical resolutions, such as 300 by 600 dpi — it's much cheaper to put in a stepper motor that moves in finer increments than to use a higher-density CCD array. The image is built up one line at a time, with each line corresponding to a single movement of the stepper motor.

To scan in color, flatbed scanners place color filters in front of the CCD to create the red, green and blue channels of the image. Three-pass scanners pass the scan head over the image three times, one with each filter, while one-pass scanners expose the image through each filter on every movement of the stepper motor. In theory, one-pass scanners should be faster and less susceptible to registration problems than three-pass scanners, but well-engineered three-pass scanners can hold their own in terms of both speed and registration. The trend does seem to be toward one-pass scanners, however.

**Slide scanners.** Dedicated transparency scanners, such as Leaf Systems Inc.'s Leafscan 45, Eastman Kodak Co.'s RFS 2035 Rapid Film Scanner, Pixelcraft Inc.'s CIS•4520 RS and Nikon Inc.'s LS-3500AF, work on a similar principle to flatbed scanners but have much higher-resolution CCDs — from 2,000 to 6,000 dpi compared with the typical 300 to 600 dpi of most flatbeds. Likewise, their stepper motors move in much finer increments.

Transparency scanners also have much more complex optics than flatbeds. Flatbeds usually expose the image either directly to the CCD or via a simple mirror, since they can assume that the original is flat and in contact with the glass. But transparencies are flexible and can "pop" in one direction or another, so often a system of lenses is employed, both to focus the image at the plane of the CCD and to make maximum use of the light from the light source. Scanning speed is mainly a function of how quickly the necessary amount of light can be transmitted to the CCD.

Some flatbed scanners also have transparency scanning attachments. This presents a new challenge on two fronts. Transparencies have a much larger dynamic range than does reflective art, and the CCDs in most flatbeds are optimized for the narrower dynamic range of print: When they try to capture the range of a transparency, shadow detail tends to get lost, and noise often appears in the darker areas. A more serious problem is their relatively low resolution: While reasonable quality can be obtained from 4-by-5-inch transparencies, scans of 35mm slides are useful only for postage-stamp-size output.

**Comparison.** Drum scanners have several technical advantages over CCD-based devices. With a CCD scanner, the stepper motor that moves the scan head is likely to introduce jitter artifacts in the image as a result of minute irregularities in movement — the scan lines aren't all the same size. On the better CCD devices, this is almost unnoticeable, but it's a problem that plagues many of the less-expensive scanners, particularly when they operate at their maximum resolution. Drum scanners use a heavy drum that spins at high speed, acting as a flywheel, and the scanner records the image one pixel at a time rather than line by line, so jitter artifacts don't arise.

A second problem affecting flatbeds is unevenness in the response of different photoreceptors in the CCD. This can be overcome by calibration, and almost all CCD-based scanners attempt to address the problem, but with varying success. Close

*See Scanners, Page 34*

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# Users find CCD scanners suit most purposes

By Steve Hannaford

*CCD devices are now used for many high-end applications.*

Technical advances and market changes have made it impossible to generalize too widely about CCD scanners. At one point, the only advantages of CCD scanners compared with photomultiplier tube drum scanners was lower price and greater ease of use. Drum scanners, on the other hand, offered greater optics, production speed and output control. As CCD scanners come of age, however, less-expensive models are being vastly improved, and the best models are encroaching on a domain that has always been dominated by high-end photomultiplier tube scanners.

The biggest question when buying a scanner is what the eventual target is, as well as the convenience and suitability of the specific scanner type. Several of the pre-press managers we spoke with had both drum and CCD (charge-coupled device) scanners. When choosing among devices, they must balance price, speed and quality and deal with the expectations of their clients.




**Quality.** One area in which CCD scanners have traditionally fallen short is dynamic range, the capability of the scanner to sample a full range of highlights and shadows. But for Mark Beale, director of research and development at Imageset Design of Portland, Maine, this is not an issue with his Scitex America Corp. Smart Scanner PS, one of the most expensive and highly touted CCD scanners. "I have heard the arguments," he said, "but we find that 98 percent of our transparencies are more than adequately handled by the Smart Scanner."

The only area in which the somewhat superior dynamic range of some drum scanners is a factor, Beale said, is in film that has been duplicated from the original, where the range is greater than in normal photographs. But, he said, this is a rare occurrence. "Otherwise, we've never had a problem capturing a full range of shadow detail," he said.

Robert Hu, general manager of A&a Printing of Menlo Park, Calif., uses a medium-priced CCD scanner, the Barneyscan 4520 (now called the CIS•4520 RS from Pixelcraft Inc.). "The Barneyscan is good enough for 80 percent of our work," he said. "Things we think it can't handle we send out to a trade shop to get a high-end digital scan from a drum scanner." A&a looks at the overall density of transparency; the color range; and sections of the image where the focus is on more subtle areas, such as finesse in the highlights or detail in the shadows, to determine which format it will use.

The general feeling among service bureau operators is that while the best photomultiplier tube (PMT) scans are almost always better than CCD scans, there may not be enough difference when using a high-end CCD scanner to make it worth the price of a large drum scanner. High-end CCD scanners can cost up to $75,000, while drum scanners can cost twice as much.

Eric DelColle, digital pre-press specialist at Modern International Graphics of Eastlake, Ohio, said his approach is to show his customers the difference between high-end Crosfield Lightspeed scans and what is available from his Sharp Electronics Corp. JX-320. "Our choice of scanner and level of quality is determined by the customer, after we show them samples," he said.

**Productivity and flexibility.** For Bruce Bayne, color systems manager in the art department at Troutman's Emporium, a Eugene, Ore.-based department-store chain that publishes its own catalogs, the Scitex Smart Scanner PS offers a big productivity advantage. "My background has been high-end drum scanners, so I was skeptical about getting a flatbed CCD like the Smart Scanner PS," Bayne said. "But I find that the ease of mounting slides is a major time savings, especially when compared to the time-consuming oil-mounting techniques sometimes required with drum scanners." (Oil mounting helps reduce a scanning artifact called Newton rings, which occurs when the film is not flush with the drum. Frame mounts on some CCD scanners minimize this problem by not forcing the film to curve over a drum.)

Another area in which CCD flatbeds can have an advantage is in odd-size or rigid reflective media. "On a drum you cannot bend the art boards, and much of our line art comes on art boards," said Rick Dyer, president of Boston service bureau Graphics Plus. Scanning such art is a main function of his Agfa Horizon scanner.

**Other uses.** The simplicity and ease of operation of CCD scanners make them ideal for a range of less-than-critical uses. Graphics Plus' Dyer uses his Agfa Horizon scanner for "all of our line-art scans and a majority of our black-and-white halftones. We also use it as a comping-grade color scanner, for work going out to our Canon [color copier] or Iris [inkjet printer), where there's no need for final output," he said. Dyer said he reserves the top-of-the-line Linotype-Hell Co. 3010 drum scanner for high-end input, such as advertising work.

Midrange CCD scanners are ideal for shops that handle a wide mix of

*See CCD, Page 36*

## Scanners

*From Page 32*

examination of most CCD scans reveals stripes in the image running in the direction of travel of the scan head, caused by irregularities in the CCD. Sometimes these stripes are almost imperceptible, and in many cases they won't appear in printed output, but drum scanners are immune to this kind of artifact since they have only one photoreceptor for each color.

Drum scanners still have productivity advantages in many situations.

A third problem is that until relatively recently CCDs couldn't handle nearly as great a dynamic range as could PMTs. As a result, CCD scanners tended to record less shadow detail than drum scanners. The gap here is definitely narrowing, with CCD scanners that are capable of recording 14 or 16 bits each of red, green and blue information per pixel.

However, drum scanners still have productivity advantages in many situations. Almost all CCD scanners produce unsharpened RGB scans and rely on the host workstation to perform sharpening and RGB-to-CMYK conversion. The dedicated color computers in drum scanners that perform these functions are generally much faster at these tasks, and they produce color-corrected, sharpened CMYK scans very quickly.

Most drum scanners also allow gang-scanning, with multiple originals placed on the drum and separate scanning parameters applied for each image. Robotic drum scanners, such as Linotype-Hell's DC 3000 series (which includes the S 3500, S 3700 and S 3800), can scan large numbers of images simultaneously, each with a different setting, and write each to a different file, providing unparalleled productivity.

The downside of drum scanners is that they are generally much more expensive and require more skill on the part of the operator than do CCD-based devices.

In the midrange scanner market, the line between PMT and CCD-based devices is becoming increasingly blurred. On the one hand, there is a new generation of compact drum scanners, such as the Optronics ColorGetter and the Howtek Scanmaster D4000, which lack the built-in sharpening and RGB-to-CMYK conversion of the larger drum scanners, using the host computer to perform these tasks. There are also sophisticated CCD-based devices, such as the Smart Scanner PS from Scitex America Corp., the Kodak Premier Image Enhancement System and the Linotype-Hell ChromaGraph S 2000, specifically designed for the pre-press market. And, of course, the Photo CD scanner is a CCD device.

As CCD scanners continue to improve, productivity rather than quality will be the key advantage drum scanners possess, and that will be offset somewhat by their high price and by the difficulty of finding skilled operators. However, we don't anticipate the demise of the drum scanner any time in the near future. □



**Imageset Design of Portland, Maine, uses a high-end Scitex Smart Scanner PS to scan images for advertisements and specialized design work. This picture of a child, from an Eastman Kodak test suite, is designed to show a scanner's ability to capture flesh tones.**



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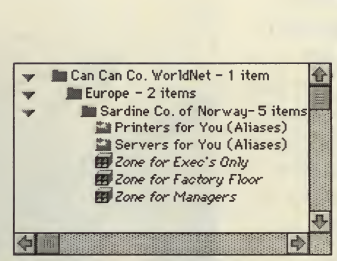
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# More-affordable drum scanners keeping companies competitive

By Steve Hannaford

*Service bureaus, graphic arts departments bring drum scanners in-house.*

Drum scanners, a market segment many might have predicted too old-fashioned to serve in the new age of digital page assembly, are finding a customer base outside traditional specialized locations such as color trade shops and large color printing houses.




As models become more affordable, more productive and easier to operate, many PostScript color service bureaus and graphic arts departments are bringing drum scanners in-house.

Consultant Vince DiPaola of DiPaola Associates in Madison, Conn., has been involved in several drum-scanner installations at key clients over the past year. His clients include major catalog and design companies, an increasing number of which are bringing scanning in-house.

"Publishers have been sending color out for years and have built up an extensive color background," DiPaola said. "They want to bring the color back in to save money and control work flow. When they buy scanners, they want high-end drum scanners like their suppliers have had."

**Marketability.** For a service bureau looking to be taken seriously in the color market, the addition of a drum scanner can make a difference. At Electrographics, a service bureau in Lansing, Mich., that now boasts an Optronics ColorGetter and a Crosfield Lightspeed ScanText drum scanner, President William Ray said: "Our objective from the beginning was to become a new version of a color trade shop. To compete with the established companies, we had to get scanners comparable in quality."

**Productivity.** Converting RGB (red, green, blue) data from a CCD (charge-coupled device) desktop scanner into printable CMYK (cyan, magenta, yellow, black) using a program such as Adobe Photoshop is a time-consuming task. Most drum scanners have built-in color computers that perform RGB-to-CMYK conversions and regular corrections automatically and semiautomatically. (Only a few of the more expensive CCD flatbeds, such as Scitex America Corp.'s Smart Scanner PS and Linotype-Hell Co.'s ChromaGraph S 2000, offer this feature.)

"Virtually all flatbed color scanners require significant cast correction and color work on a desktop computer," said Electrographics' Ray. "With our Crosfield scanners we get a usable color-corrected scan almost all of the time directly from the scanner."

According to color-publishing consultant Michael Kieran of Desktop Publishing Associates in Toronto, a color computer can justify the higher price of a drum scanner. "With an expert scanner operator and a good color computer, 80 percent of the scans come through, requiring very little messing around," he said. Another savings, Kieran said, is using the unsharp mask algorithms built into color computers. Unsharp masking, a technique by which images are given sharper detail, is used on the majority of scanned images but remains a relatively slow task on the desktop.




These images (at left) from a children's science book were captured by a high-end Crosfield Magna-Scan Plus drum scanner at Sarabande Press in New York. The image below was scanned at Electronic Publishing Specialists in Los Angeles using a Howtek Scanmaster D4000, one of the least-expensive drum scanners available.



**Features.** Most drum scanners have features that allow you to scan a wide variety of sizes of reflective artwork or transparent film. That's why Van Tanner, president of Desktop Publishing Services service bureau in Greensboro, N.C., settled on a Scanmaster D4000 drum scanner from Howtek Inc.

"The quality differences between good CCD and drum [scanners] are minimal given a professional operating them," he said. "The real difference is formatting and features. We were constantly being bombarded with reflective art and with transparencies that had to be blown up over 400 percent. With our flatbed, we found ourselves sending out 10 percent of our work."

But by sending a client's work out of house, a service provider can lose that client to a competitor, Tanner said. "If you lose out on a few features, you can lose the whole ballgame."

**Competitiveness.** As the stakes get higher in PostScript color, the cost of staying in the game grows. To expand, even to hold on to current work, often means providing faster and higher-quality scanning.

For many sites, this can mean acquiring a drum scanner, if only in self-defense. On the plus side, it can mean a considerable growth in business. According to Randy Green, president of the Electronic Publishing Specialists service bureau in Los Angeles, "Since we bought our Howtek drum scanner last year, we've seen a steady build in color work."

Ironically, as a number of traditional color trade shops are going out of business, many color service bureaus are finding their drum scanners busy to capacity. □

## CCD

*From Page 34*

jobs. "Except for photographs of models or subjects with very dark backgrounds, we will do almost anything on our [Agfa] Arcus scanner," said Tom Bromley, president of Centre Grafik, a Wayne, Pa., service bureau. "And the scans go in brochures, catalogs, newsletters and slide presentation work."

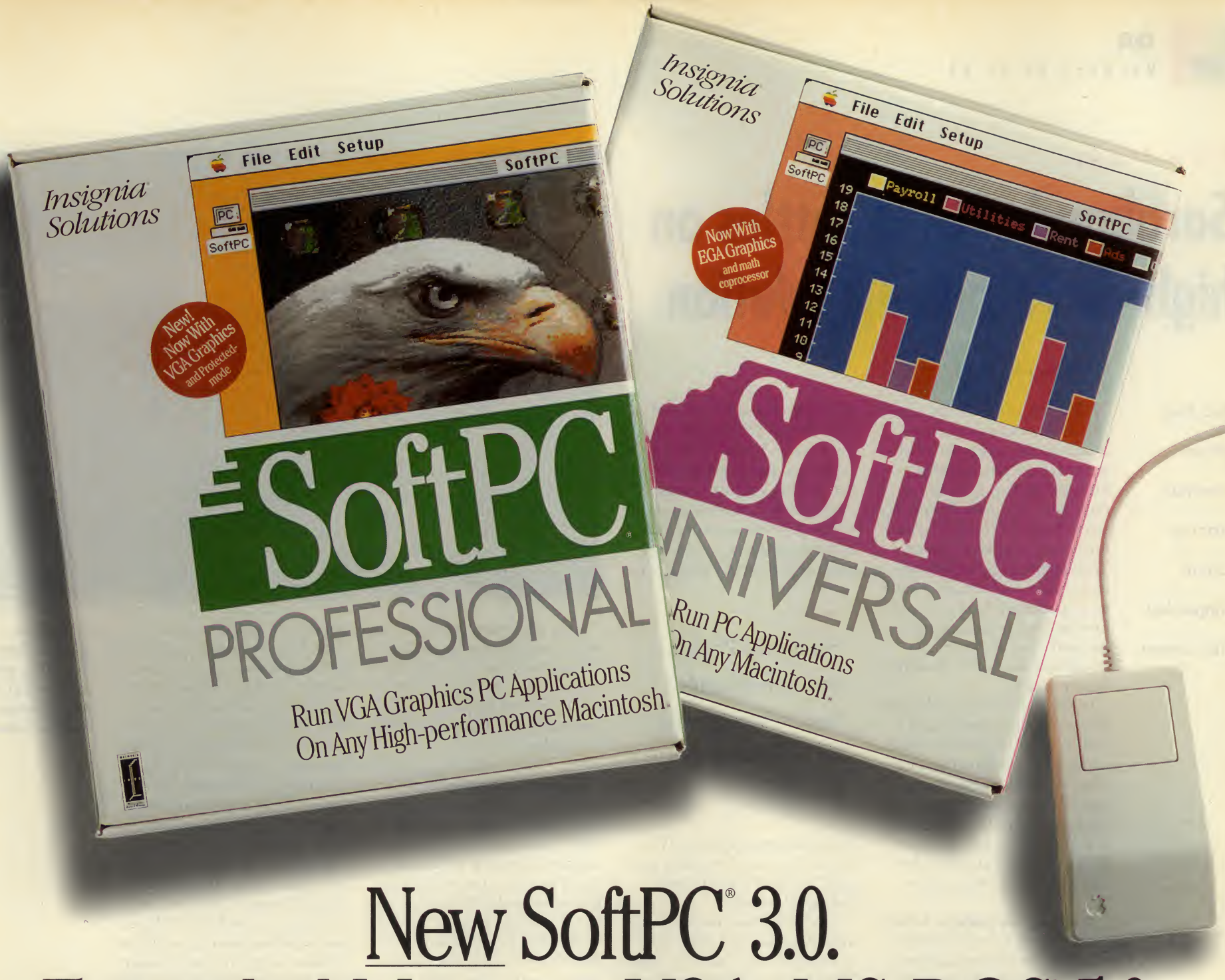
**Blurring the lines.** As CCD technology improves and drum scanners drop in price, quality, productivity and cost distinctions may die. "We know that some high-end trade shops we compete with actually do commodity scans on CCD desktop scanners in the [desktop publishing] department — without telling their clients — and achieve acceptable results," Bromley said. "You get the work done using the appropriate means."

Less-expensive scanners are useful for quick, nonexpert turnaround on comps, low-resolution output or other noncritical uses, but even the $1,000 desktop color scanners have improved immensely over recent years. The highest-quality scanners, operated by experts, are necessary for cover art, drop-dead ads or coffee-table-quality publication; however, good scanners are so close in quality now that hardware distinctions are becoming less important — scanning software and operator skill are now key elements (see story, Page 32).



This Kodak test image, scanned with a Scitex Smart Scanner PS at Imageset Design, illustrates the quality of shadow detail that can be captured today with a high-end CCD scanner.

"In the end, CCD and PMT technologies are becoming fairly comparable," said A&a Printing's Hu. "People get all worked up about it in the trade, but to most users, the technology is a nonissue." □




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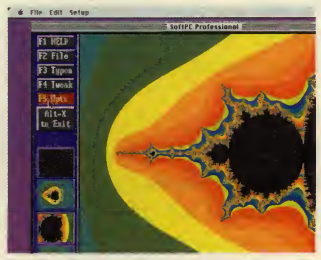
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Case Study

# Sarabande Press settles on high-end scanning solution

By Steve Hannaford

*New York service bureau is thriving with its MagnaScan Plus scanner.*

It may be unusual to find a massive drum scanner in what is essentially a design shop and service bureau. But Sarabande Press in New York is unusual in many ways. It is probably the only service bureau in North America with an unlisted phone number. The company does not want random, walk-in clientele, and it builds on its specialized client base, partly from the book-publishing world and partly from the Manhattan graphic arts community, through word of mouth.

Its $99,000 Crosfield Lightspeed MagnaScan Plus scanner (until recently called the ScanText Plus) sits in its own climatized booth, a calm island in the midst of a busy page-assembly, design and color-output operation. Other equipment in use includes an Agfa SelectSet 7000 imagesetter, a Canon color copier and an Iris inkjet printer.

**Charting the waters.** Before purchasing the Crosfield scanner, Sarabande used to buy scans from color trade shops, said principal Joe Freedman. "But that got stale for two reasons," he said. "First, they looked on us as competition, and they weren't happy to work with us. We were taking the page assembly work they wanted. Second, and more important, the turnaround was too slow. It took two days for us to get the scans back. We couldn't live with that kind of turnaround."

After a few years of imagesetting, comping and color-scan correction, Freedman and his key employees were confident at producing, calibrating and proofing color. "We had the loop closed except for scanning," he said. "We were really making color work."

> Sarabande Press is probably the only service bureau with an unlisted phone number.

Sarabande Press competes with local shops, but even more with overseas pre-press houses in Japan, Hong Kong and Singapore. Freedman wanted a situation where he could provide rapid turnover combined with excellent quality at a price that could remain competitive with the Asian shops.



TOM SOBOLIK/BLACK STAR

**Joe Freedman, principal of Sarabande Press, poses in front of his Crosfield MagnaScan Plus drum scanner.**

A big investment in equipment was intimidating for his small shop but necessary for its survival. He researched the purchase by sending work out to shops with different machines and judging the relative quality.

**Drumming up business.** Freedman finally settled on the MagnaScan Plus for several reasons. "We wanted to buy a machine that was at or near the top of the line in terms of quality, and no one makes better scanners than Crosfield," he said. "Second, we wanted an easy link to the Macintosh, and this unit was the best one at the time. Third, Crosfield offered a very good training course. Also, we needed high productivity."

Sarabande is working on a children's science book series that requires 200 to 300 scans per book, turned over in less than a month. He and his operators can turn out 40 scans in one shift, when necessary, and the high quality of the scans they get means minimal color correction in Adobe Photoshop before the image is placed on the page.

Sarabande is prospering now, but Freedman realizes he must stay ahead of his competition. An extra service he provides his clients that many traditional shops do not is to give them a digital copy of their scanned images. This allows clients to reuse the art for CD-ROMs, secondary publications or new editions without having to rescan the images or be beholden to Sarabande. While this practice runs the risk that Sarabande's clients will go elsewhere with the follow-up project, it's a service that Freedman said his clients are beginning to demand. □

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NIKON INC.
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SCITEX AMERICA CORP.
**Smart Scanner PS:** $75,000
**SmartTwo PS:** $35,000
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### DRUM SCANNERS

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DANAGRAF NORTH AMERICA INC.
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**ScanMate Plus:** $34,995
**ScanMate 5000:** $45,000
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**S 3700:** $127,700
**S 3800:** $146,700
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OPTRONICS
**ColorGetter:** $70,000
**ColorGetter Plus:** $80,000
**ColorGetter II:** $42,450
**ColorGetter II pro:** $48,450
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Phone (508) 256-4511; fax (508) 256-1872

SCREEN USA
**ISC-2010:** $65,000
**DT-S1015:** $38,900
**DT-S1015 AI:** $46,600
5110 Tollview Drive, Rolling Meadows, Ill. 60008
Phone (708) 870-7400; fax (708) 870-0149

*The products listed here are the latest models sold by the companies mentioned in the stories. High-end scanner prices vary depending on configuration, which can include a computer, software, training, installation, support, interface hardware and furniture.*

# "HOW I DISCOVERED QUICKEYS™ AND SAVED THE EARTH"



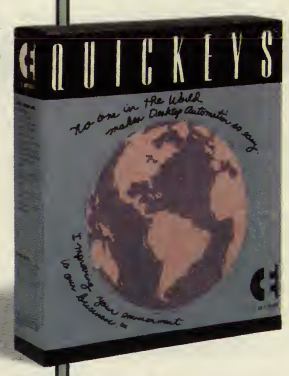
**It all started last June**
here at Earth Lovers Landscaping, when I discovered money doesn't grow on trees. So I went digging for ways to save money and make the Earth a better, more profitable place. Which is how I found QuicKeys. With QuicKeys I have replaced repetitive tasks I perform all day – every day – with a single keystroke or a mouse click. QuicKeys allows me to plant lots of time-saving and money-saving shortcuts directly into my business.

"Earth Lovers Landscaping" is a whopping 22 keystrokes. QuicKeys can save one week a year by typing it in just one keystroke.

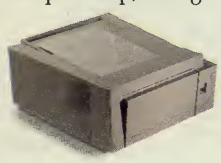


Earth Lovers' employees can launch applications with one keystroke, saving 5-10 seconds every time, or 2.5 weeks a year.






When it's time to fax Earth Lover's designs or quotes to customers, they use QuicKeys to switch from printer to fax modem in one quick step, saving 20-25 seconds each time — that's 2.5 days a year.



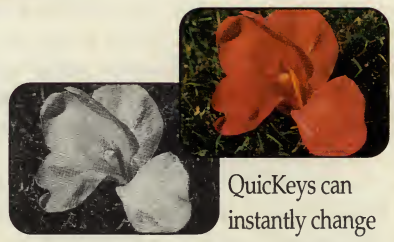
*Time savings are all based on a 10-person office.

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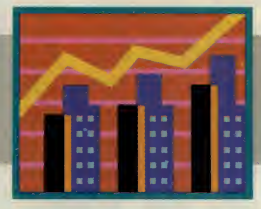
QuicKeys can instantly change control panel settings. Each time Earth Lover's landscape designers change the number of screen colors displayed, they save 25-30 seconds. This one shortcut adds up to a savings of three days a year.

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# BUSINESS WATCH

- Industry news
- Market trends



## Silicon Valley losing high-tech jobs

*At least 20,000 jobs relocated since 1991*

**By Jon Swartz**

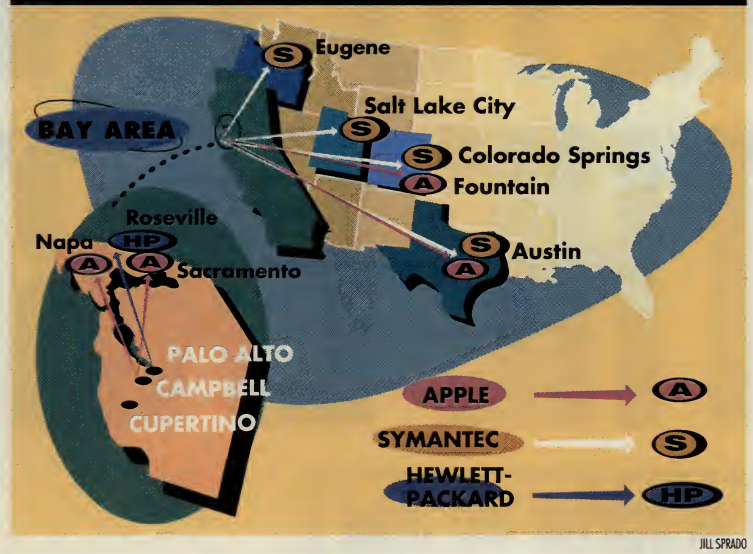
San Francisco — Silicon Valley appears to be the victim of its own success.

Symantec Corp. last month joined a growing list of Mac and DOS companies that are expanding outside the pricey San Francisco Bay area when it disclosed plans to relocate up to 100 jobs.

At least 20,000 computer-related Silicon Valley jobs have been lost over the past two years to other U.S. locations where economic development agencies and chambers of commerce are wooing companies with lower labor and housing costs, cheaper land, and tax breaks.

And the news isn't expected to get much better: The California Business Roundtable's poll of 1,325 California companies revealed that 44 percent intend to expand outside the state soon.

**California, here we go**




JILL SPRADO

▸ **Symantec** CEO Gordon Eubanks last month confirmed the Cupertino, Calif.-based software company is scouting Eugene, Ore., and several other sites to relocate service and support operations. He said other sites include Austin, Texas; Salt Lake City; and Colorado Springs, Colo.

▸ **Apple USA** of Campbell, Calif., last year opened a customer-support center in Austin, which now employs more than 600 people. In recent years, the company has also established a 200-person data and telecommunications center in Napa, Calif.; a 150-person West Coast logistics cen-

*See Moves, Page 42*

## InterCon to sue Apple over TCP

**By Mitch Ratcliffe**

Herndon, Va. — InterCon Systems Corp., a Macintosh TCP/IP developer, intends to file a lawsuit this month against Apple for trademark infringement, InterCon's general counsel said last week.

InterCon makes TCP/Connect II, an application that offers a TCP/IP terminal, network news and electronic-mail services. The company said it has already received customer-support calls for Apple's TCP/IP protocol stack, formerly called MacTCP but now called TCP/IP Connection for Macintosh.

"We created the market for [Apple] by shipping MacTCP with everything we make, and now they've decided to take it away from the third parties," said Mikki Barry, InterCon vice president and general counsel.

Customers are especially confused by the new name Apple chose because InterCon's TCP/Connect II requires users to install and run Apple's TCP/IP Connection.

Barry said: "Can you imagine what our manuals are going to look like? 'In order to run TCP/Connect II, you must first install TCP/IP

*See InterCon, Page 42*

## Mail-order catalog firm resurfaces

**By Jon Swartz**

Waitsfield, Vt. — Mac mail-order catalog customers who thought they were seeing double when they recently spotted ads for two different companies named Maya can now rest easy. The confusion appears to be over.

The principals of the original Maya, which went out of business last summer amid multimillion-dollar losses and corporate infighting, have emerged at two competing companies.

▸ The company now called Maya Computer Inc. is run by Jahan Salehi, who co-founded the original Maya in 1988.

Salehi recently acquired the Maya name by outbidding Don Mayer, another co-founder of the original company, in a bankruptcy-court auction. Salehi then applied the name to a mail-order catalog company based in Dobbs Ferry, N.Y., formerly called Solute. Maya offers new and used Macs, as well as monitors and video boards from Apple, SuperMac Technology Inc., Radius Inc., RasterOps Corp. and others.

▸ One of Maya's primary competitors, launched last year under the name Maya 2.0 Inc., changed its name to River Computer Inc. after Salehi acquired the Maya name. Run by Mayer, River is bankrolled by yet another mail-order reseller, MacConnection of Marlow, N.H.

A spokeswoman said the Waitsfield, Vt.-based River will bundle utility and diagnostic software with used Macs and introduce a line of external and internal hard drives for the Mac.

"The old Maya is dead. These are two different companies," Salehi said.

Mayer said: "It's a messy story. Some weird things have gone on for months."

Among other things, Mayer has accused Salehi of trying to strangle him after a heated exchange and of attempting to take over the company last year while Mayer was abroad.

Salehi denied both charges. □

## Apple, Honeywell are hoping Quadra 800 sales take flight

**By Lisa Picarille and Raines Cohen**

Cupertino, Calif. — The Quadra 800 is about to take flight as Apple and Honeywell Inc. announced a deal that will put Macs aboard commercial airliners.

The deal marks the first time Apple has entered into a hardware and software OEM relationship with another company, said Eric Sirkin, Mac licensing/OEM business manager for Apple.

According to Apple officials, Apple was approached by Honeywell, and after more than nine months of negotiations, the two companies signed a deal in which Honeywell will manufacture and resell an Electronic Library System (ELS) that incorporates a ruggedized avionics version of Apple's Quadra 800.

Although Honeywell will write ELS applications, the aerospace giant has also licensed Apple's firmware and System 7 operating system products as part of the deal, according to Mark Wu, Apple OEM business manager.

The ELS machine is designed to provide flight crews, cabin attendants and ground maintenance crews with timely access to all the information necessary to operate and maintain an aircraft except for aircraft control.

"There are aircraft that carry as much as 110 pounds of paper," said Mark Anderson, engineering section head of ELS Systems Development for Honeywell's Air Transport Systems Division in Phoenix.

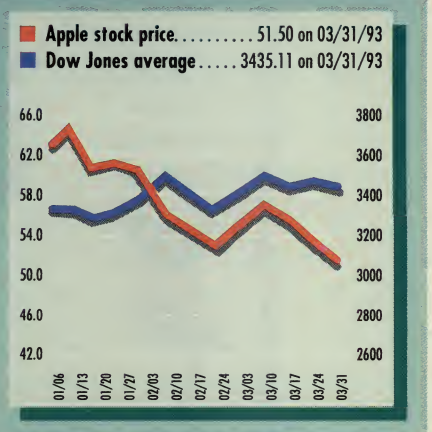
Apple's Sirkin said more OEM licensing agreements similar to the Honeywell deal are forthcoming.

Apple officials said the company is pursuing OEM deals with other vertical markets, such as retail, transportation and medical imaging. □

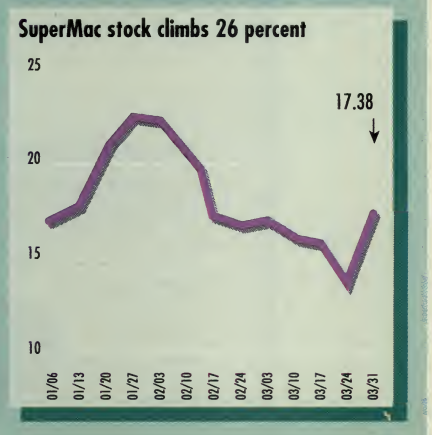
**StockWatch**

| | 03.31.93 CLOSE | WEEKLY % CHANGE |
|---|---|---|
| **Apple** | 51.50 | -4.19 |
| SOFTWARE DEVELOPERS | | |
| Adobe | 43.00 | -0.29 |
| Aldus | 19.50 | 14.71 |
| Caere | 13.00 | -1.89 |
| CE Software | 4.00 | 18.52 |
| Microsoft | 92.50 | 7.25 |
| Novell | 33.00 | 0.38 |
| Symantec | 12.88 | 7.29 |
| PERIPHERALS VENDORS | | |
| CMS | 2.25 | -5.26 |
| HP | 76.13 | 4.64 |
| Mass Micro | 0.38 | -14.29 |
| QMS | 14.63 | 1.74 |
| Radius | 3.75 | -3.23 |
| RasterOps | 5.88 | -16.07 |
| Sigma | 5.50 | -4.35 |
| SuperMac | 17.38 | 26.36 |
| STORAGE | | |
| Conner | 15.38 | -1.60 |
| Maxtor | 7.75 | -7.46 |
| Quantum | 12.75 | -0.97 |
| Seagate | 14.88 | 1.71 |
| SyQuest | 12.88 | 5.10 |
| INDUSTRY INDICATORS | | |
| DEC | 43.38 | 2.97 |
| IBM | 50.88 | -0.49 |
| Motorola | 66.25 | 3.31 |
| Sun | 30.00 | 6.67 |
| Dow Jones | 3435.11 | -0.30 |

*Compiled by Nordby International Inc.*




**SuperMac stock climbs 26 percent**




***SuperMac Technology Inc., based in Sunnyvale, Calif., continued its strong performance on Wall Street. The company's stock last week rose 26 percent to close at $17.38 per share.***

***Meanwhile, its rival monitor and graphics card developers struggled. RasterOps Corp.'s stock declined 16 percent to $5.88, while Radius Inc.'s stock was down 3 percent to $3.75.***

If the stories you've heard about Thunder/24™ led you to believe it's the fastest color graphics card, the results of a new, independent lab test will leave you thunderstruck.

In a Hydra QuickDraw™ performance test, Ingram Laboratories found PrecisionColor 24X™ was up to 19% faster.

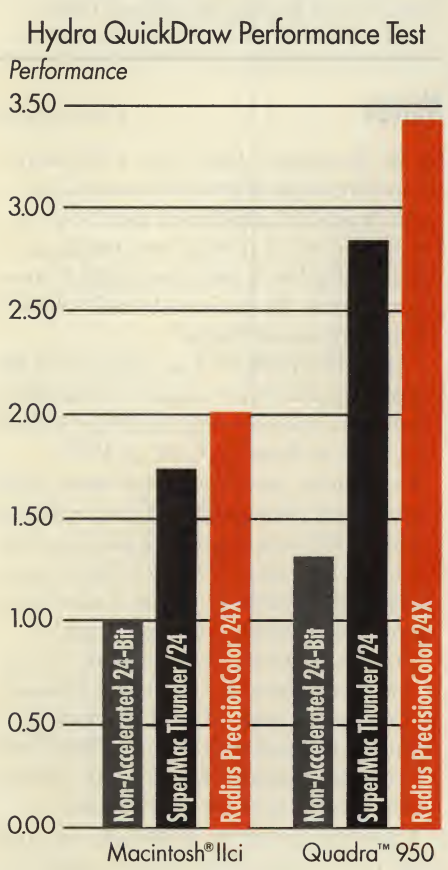
That's surprising, especially since the makers of Thunder/24 want you to pay $1,250 more for their card.

PrecisionColor 24X isn't just faster and less expensive. It's also available in 7" and 9" versions. So it will fit in all of Apple's newly-announced systems, as well as current models.

No wonder MacUser rated PrecisionColor 24X "Best Price/Performance." And both MacWorld and Byte named it their "Readers' Choice."

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# Frame's poor 1st quarter prompts reorganization, halts merger plans

**By Bruce Wright**

San Jose, Calif. — Frame Technology Corp. had a double dose of bad news for stockholders last week. It announced it will restructure its North American sales force as a result of a 15 percent to 20 percent drop in first-quarter sales and said the negative results have scuttled its proposed $54 million merger with Verity Inc., a privately held software database developer in nearby Mountain View.

Frame had planned to fund the merger by issuing 3.5 million shares of common stock. Instead, Frame will take a $2 million equity stake in Verity. Both companies did not rule out a merger in the future.

The sales decline, which company officials blamed on lower-than-expected domestic sales, is based on projected revenues of $20.5 million for the quarter ended March 31. A company spokeswoman said international and OEM sales "remain on plan."

The sales reorganization creates two independent sales organizations at the publishing systems company. Both groups report to Frame CEO Paul Robichaux.

The Document Solutions Group will work directly with corporate customers to develop custom applications based on FrameMaker and other products.

The Desktop Products Group will focus on end-user demand in conjunction with Frame's distribution partners — Ingram Micro Inc., Merisel Inc. and Access Graphics — in joint marketing and sales activities.

Frame went public last year, with its stock peaking at $26.50 per share. Since then, Frame's stock has steadily declined to $8. □

## Apple multimedia group

Cupertino, Calif. — Apple last week formed a new organization aimed at putting the "multi" into its multimedia efforts.

Called the New Media/New Markets group, its goal is to increase market access to multimedia, expand multimedia content, oversee Apple's multimedia developer program, and work with third-party developers, according to Apple.

The unit is headed by Satjiv Chahil, an Apple vice president, and is part of the Macintosh Systems Division (MSD). Apple's worldwide multimedia marketing group already falls under MSD.

Multimedia technology will remain prominent in other Apple divisions. QuickTime is under the Macintosh Systems Architecture Division. □

## InterCon

*From Page 40*

Connection from Apple. Please call them for TCP/IP technical support, but call us for TCP/Connect support.' "

InterCon has shipped about 50,000 copies of its TCP/Connect II TCP/IP network services application since 1989, according to a cease-and-desist letter sent to Apple lawyers in November. InterCon applied for a trademark on TCP/Connect and, after a mandatory opposition period expired recently, is awaiting final registration of the trademark.

InterCon in November also demanded that Apple refrain from the use of the name OSI Connect for its X.400 gateway products because the company has applied for trademark protection of that phrase.

"We wanted to go through all the business channels first, and it looks like we've reached the end of that rope," Barry said. She added that Apple executives have told InterCon it must sue to get the TCP/IP product's name changed.

The MacTCP-to-TCP/IP Connection name change and increased bundle pricing for developers, she said, appear to be calculated moves on Apple's part to capitalize on TCP/IP market name recognition earned by InterCon.

Apple declined to comment. □

## Moves

*From Page 40*

ter in Sacramento, Calif.; and a 100-worker components repair center in Fountain, Colo.

An Apple USA spokesman said: "We saw a lot of positives in moving our operations to Austin — the lower costs, the nearby University of Texas, the business-friendly climate. There were a lot of things."

▸ **Hewlett-Packard Co.** officials said the peripherals maker will "redeploy" 500 employees from its customer-support division in Palo Alto, Calif., to Roseville, Calif., by 1995.

Gary Burke, president of the Santa Clara County (Calif.) Manufacturing Group, estimates at least 20,000 computer-related jobs have been lost out of state since 1991. "It's silly to expect double-digit growth in Silicon Valley today when so much business is leaving," he said.

Angelos Angelou, vice president of economic development for the Austin Chamber of Commerce, said, "The [California] government lost touch with what it takes to build a formidable business climate — and companies have called us to see what we have."

Evidently, California businesses like what Austin has to offer. Half of the companies on the chamber's prospective client list are from California, Angelou said.

The high-tech exodus has prompted California's leading political and business leaders to come up with strategies to keep business in the state. One study, spearheaded by Peter Ueberroth, the organizer of the 1984 Summer Olympics in Los Angeles, proposes sweeping changes in workers' compensation, business taxes and environmental law.

Meanwhile, Joint Venture: Silicon Valley was formed last year to revitalize the valley's infrastructure. The organization — composed of executives, labor leaders and environmentalists from more than 100 companies — will issue a five-year business plan in June.

"Most companies that leave here do so reluctantly," said Joint Venture President Tom Hayes. "But the regulatory morass and other factors have made it difficult for them to stay." □

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EDITORIAL

# Putting the spin on consumer strategy

With the unveiling of Apple's PowerCD and audio speakers, the company seems to be advancing headlong into the market known as consumer electronics.

This move raises several questions: Can a company scarcely noted for effective management of supply and distribution hold its own in the fast-moving world of retail marketing? Are Apple's name and user-interface expertise sufficient to enable it to compete against the Japanese giants who now dominate the consumer category? And how do Apple's new directions relate to its core computer business?

To our knowledge Apple has yet to offer clear answers to these questions. Grandiose proclamations about the convergence of computing, communications, publishing and entertainment don't fill the bill.

But we think we know what Apple's strategy *should* be in these markets: Use the Mac and its existing customer base as the foundation for its new businesses, offering products that are compelling by virtue of their synergism with the Mac.

To some extent that is what Apple is doing already, but it should be bolder and more forthright in articulating the connection. Take the PowerCD, its upcoming portable CD/Photo CD/CD-ROM player, for example. On the surface, it's hard to see just what use business buyers might have for what looks like a high-tech toilet lid. Corporate managers aren't likely to jump for a device that lets their users display multimedia encyclopedias and family snapshots on the TV.

But if, as reported in last week's MacWEEK, Apple plans to offer hardware and software that will make it easy and inexpensive for business users to create their own cross-platform CD-ROMs, the PowerCD takes on a whole new character, as a versatile vehicle for delivering snazzy presentations and rich training materials.

In that light the device itself has new appeal, and the Mac takes on new value as an authoring environment. If indeed this is Apple's plan, we think it should say so now, even if all components of the system won't be available for months. □

**Commentary**

# How will IBM's Renaissance man see partnerships?


JEAN-LOUIS GASSÉE

After months of speculation and tantalizing gossip, IBM Corp. went for a safe, experienced executive — Louis V. Gerstner Jr. from RJR Nabisco Holdings Corp. and formerly American Express Co. Inc. — as its new CEO. The choice is a little perplexing, and it raises questions about what IBM's board thinks the company's problems are, the direction implied in that assessment and the consequences for IBM partners such as Apple.

Some observers have questioned Gerstner's command of computer technology and industry issues. IBM's PR machine disgorged an obligatory but unconvincing answer: The new CEO was "involved" with information systems at American Express. Isn't that like saying you can be a great chef because you've eaten in restaurants a lot?

But IBM is in obvious financial pain, and judging by the size of the company's recent losses, the symptoms could even be life-threatening if a cure isn't found. Gerstner seems well-suited to directing the treatment: A much-admired executive, respected for his intellect and leadership, he comes in with a wealth of experience in cost-cutting and restructuring.

IBM's management, itself admired in the past, is now seen as antiquated, inbred, big, bureaucratic and expensive. The criticism is probably just as excessive as we now perceive the past praise to have been. Nonetheless, Gerstner brings the skills and energy to deal effectively with IBM's structure and culture.

**Will it be enough?** True, one can argue that IBM's ponderous decision making and culture cost the company a head start in many areas where it either invented the technology or had an early leadership position, ranging from RISC to PCs, disk technology, printers and networking.

But one can also argue that placing bets on technology, making choices for the future, is often a matter of ineffable knowledge as opposed to polished boardroom-quality slide presentations. It's the same kind of hard-to-codify data, embedded in one's life experience, that separate a set of equally interesting recipes from a grand culinary experience.

**Scrutinizing Pink.** Under the new regime, many of the company's technology decisions, especially the expensive ones, are likely to be revisited. In the cost cutting, restructuring, spinning off and jettisoning that are sure to come, one or several components of the alliance with Apple could come up for review and possible redirection. This could be destructive.

Regardless of the inevitable heroic pronouncements of the optimistic early days, difficult, complex projects take a long time and can offer enormous payoffs if carefully nurtured to their original or updated destination. If the Mac took from 1979 to 1984 for announcement and '86 or '87 for real completion, and if Newton needs from a 1987 start to a '93 test, just imagine what a monumental endeavor such as Pink needs.

Let's hope Pink will be judged by the marketplace and not second-guessed by cost cutters.

Speaking of optimism, Gerstner may have been lured to IBM, despite its daunting problems, by an updated version of the famous Steve Jobs taunt: "Do you want to spend the rest of your life selling cancer and cholesterol, or do you want to save this great American icon?"

Let's hope he'll prove wrong both the skeptics and the industry executives who lacked the nerve to take up the gauntlet.

After all, the other chairman from the consumer industry did fare pretty well. □

LETTERS




## Integrated software market: Lead or get out of the way

I wholeheartedly agree with the letter from Microsoft Corp. (MacWEEK, March 29) that the integrated category is experiencing tremendous growth.

I would also like to point out that this growth began in late 1991 when ClarisWorks first shipped. By offering a truly integrated product rather than a group of separate modules bolted together, ClarisWorks breathed life into a category that had languished for years.

Many observers agree that an analysis of market share based on dollars is less ambiguous than market share based on units. By both measures, industry analysts agree that ClarisWorks held the leading share in 1992.

Users firmly established ClarisWorks as the No. 1-selling integrated product for Macintosh in 1992. And now that ClarisWorks 2.0 has shipped with "enough bang for its $299 to rival not only other Macintosh integrated packages but full-blown applications," sources have observed (MacWEEK, March 1), we trust customers will become even more enthusiastic about ClarisWorks in 1993.

*Bob Lisbonne*
*Group product manager, integrated products*
*Claris Corp., Santa Clara, Calif.*

## The right tool is meaningless if you lack requisite skills

The editorial "Technology alone won't fix economy" (MacWEEK, March 8) was right on target. Most training programs that have attempted to teach technology skills, especially computer skills, have been dismal failures when measured by the student's ability to find jobs afterward. This is because we have forgotten that the computer is a tool to automate processes. Knowing how to operate a microcomputer is not a job in and of itself.

This was made clear to me when my organization attempted to procure project management training for several staffers. These individuals were being asked to perform project management tasks although they were not trained in classical project management. We mistakenly assumed that project management software and training would turn them into project managers.

We contracted with a local Mac training service for a weeklong course in project management. What we received was one week's worth of project management software training. The instructor did a mediocre job of explaining the software's advanced features. And the instructor knew even less about project management than we did. At the end of our week of training we were no closer to our goal of understanding project management than when we started.

Automated tools for project management are of little or no use to those who do not understand project management. Technology training has no value to people who have no skills to automate.

*Lacey Hartie Jr., senior cartographer, Defense Mapping Agency Aerospace Center, Fenton, Mo.*

## Customer judges RAM scam worthy of complaint to FTC

I am a professional photographer, and I purchased a Mac IIvx in November 1992, to assist me in my vocation. Manipulating images requires large amounts of memory, and the IIvx was advertised as being capable of accessing up to 64 Mbytes of RAM. However, neither my dealer nor I can find the necessary 16-Mbyte SIMMs that are compatible with it.

After six weeks of frustration, I called the executive offices at Apple and spoke to Joe Kadich, who promised to track down the problem. After a few weeks, he informed my dealer and me that, according to Apple's own engineers, there are no 16-Mbyte SIMMs compatible with the IIvx.

I asked if he would authorize a refund or an upgrade to a Quadra, which can access up to 64 Mbytes of RAM. He refused, telling me essentially that the problem is mine, not Apple's.

Since that time, I have filed suit in the District Court of Maryland against Apple, and the case is being reviewed by the Federal Trade Commission for possible false advertising claims made by Apple.

*Barry Myers, photographer, Silver Spring, Md.*

## Today's Mac, yesterday's OS do not a happy end user make

Does Apple think we're stupid? I recently purchased a PowerBook 145. I realize that it's not a top-of-the-line model, but with internal modem, shipping and taxes it amounted to a pretty penny.

Imagine my surprise to discover that the About This Macintosh... command revealed that the operating system thinks it's a PowerBook 140. After some initial confusion, I learned that System 7.0 was released before the 145, and thus it doesn't "know" of it.

I then realized that I had purchased a new Mac with outdated software. Apple is selling new machines with old system software while selling System 7.1 separately.

I've raised this issue with Apple technical support and customer relations but to no avail. Apple is scamming the consumer.

*Steve Schwaid, news director, WVIT-TV Hartford, Conn.*

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*Send letters to MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MCI 323-1203; Internet, letters@macweek.ziff.com; fax (415) 243-3650. Include your name, address and phone number. Letters should not exceed 300 words. We reserve the right to edit for clarity and length.*

**The Mac Manager**

# Claris may be giving users the Clear Choice they need



DON CRABB

Software costs too much. Every time we buy a new package it comes with a million features we'll never use. Why does it seem like it takes forever for the big software houses to get out new releases?

How many times have you uttered complaints like these? Probably dozens — and just in the past week or so.

The ugly truth of the Mac commercial software market is that it's overrun with products that are expensive, bloated and belated.

Unfortunately, until recently, you didn't have many alternatives to the expensive fatware. You could try shareware or public-domain offerings but not completely without risk. Even though much of this kind of personalware can be outstanding, support is often a problem, especially when you're using such applications in mission-critical ways.

It's pretty dicey when your boss asks why the Cramer report isn't done and you answer, "Because we're having trouble getting in touch with Mary Smith, the author of the program we're using for the report." Shareware has its place in every corporate Mac setting, but usually that place isn't where the rubber meets the road.

**Is there a clear choice?** Claris Corp., however, thinks it has an answer to this problem. It recognizes that we need better tools that cost less, come to market quicker and can be relied on for critical functions. It recognizes that we want Neiman-Marcus service for a Kmart price. The solution is called Claris Clear Choice.

Clear Choice is all Claris, despite the fact that it's a separate division in the company run by Bruce Chizen. Bruce's mission is to find clever and useful software (he'll start with utilities) from independent authors and small developers, do some serious quality-control work on it, beef up the manuals and on-line help, and wrap the whole thing in the solid Claris support system.

So far, the selections have been limited but encouraging. By purchasing and repackaging the Retrieve It!, BrushStrokes and UP (now Power-to-Go) programs, Claris has made an important statement about how the Clear Choice division will operate. It intends to nurture high-quality small developers and give them a chance to make some real money, without their needing to find venture capital and without their taking on the resource-sucking burden of support.

**Take it to the limit.** Let's suppose that Claris really runs with the Clear Choice idea, a course of action I endorse. Consider how Claris might operate if more of its products were developed along Clear Choice guidelines. This is the story behind the success of the excellent ClarisWorks, which is essentially the domain of a small development team in Washington state. The group has already produced Version 2.0, less than a year and a half after the original release. Compare this with the development period for MacWrite Pro, which made the gestation period of an elephant seem reasonable.

By making the Clear Choice development model an internal standard, Claris could show us the way out of the wilderness of expensive, untimely fatware and into the land of affordable, punctual and compact software. □




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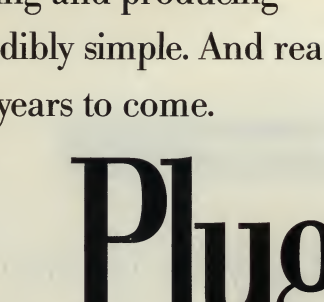
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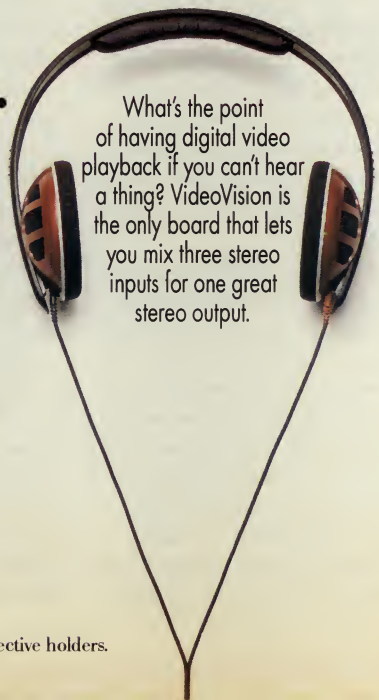


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# Reviews


- Multi-Ad Creator. See Page 54.
- PowerLink Presentor. See Page 54.


# Objective pushes data analysis to next level with SpreadBase

*Category-based modeler features good report capabilities but suffers from a lack of integration.*

**By Jonathan A. Oski**

The first version of SpreadBase, Objective Software Inc.'s category-based modeling application, follows the spirit of data-analysis tools such as Occam Research Corp.'s MUSE, Brio Technology Inc.'s DataPivot and Cognos Inc.'s PowerPlay.

With SpreadBase, however, Objective hopes to define a second generation of data-modeling tools that is broader and more functionally rich than any of its predecessors. SpreadBase allows you to analyze your data quickly from a variety of perspectives and transform it from its rawest state to slick reports using a single integrated application.

**Hefty requirements.** To perform, SpreadBase's demands are significant. Objective strongly encourages the use of Quadra-class workstations with fast disks and at least 16 Mbytes of RAM. The application demands a minimum of 3.5 Mbytes of RAM to load, but you will be severely limited in the amount of data you can work with in this configuration.

During our tests, we ran SpreadBase on a Quadra 700, as well as a Mac IIci and SE/30, both of which were equipped with a PowerCache 50 from DayStar Digital Inc. All of these test workstations had 20 Mbytes of RAM installed — based on our experience, we would recommend no less.

The complete package is compressed onto four disks. To install SpreadBase you must copy these files, which include the application, some sample models and a training module, to your hard disk and expand them separately. A complete installation consumes close to 20 Mbytes of disk space.

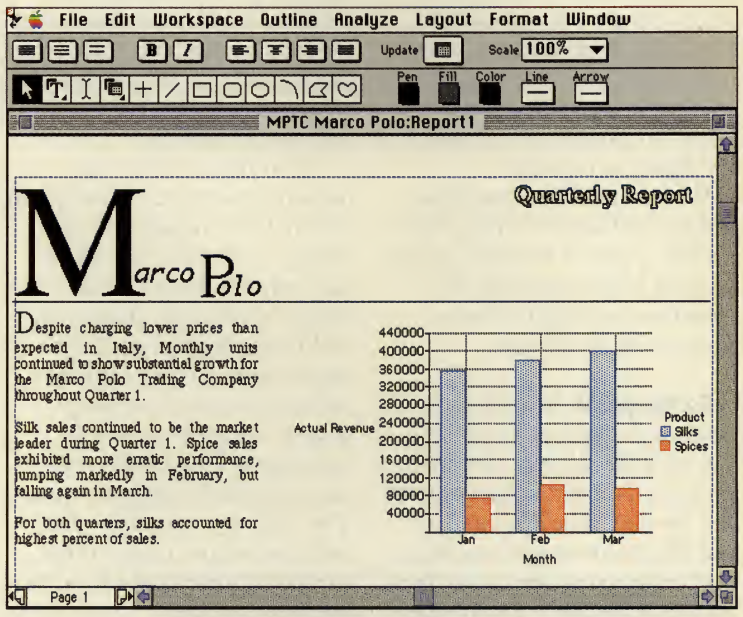
This process is somewhat clumsy, and Objective plans to simplify the installation process in a forthcoming release that will use Apple's Installer utility.

**Category-based modeling.** Perhaps the biggest challenge to using SpreadBase is learning new modeling constructs. Many of today's spreadsheet jockeys have backgrounds in accounting and finance. The cell-based electronic spreadsheet is easy to comprehend because it's an analog to paper-based forms.

Databases impose structure upon groups of information, and herein lies one of SpreadBase's fundamental strengths. Using a proprietary relational database as a foundation, Objective provides a familiar, spreadsheetlike interface with which you can quickly build models to analyze the relationships that exist within your data. As such, SpreadBase provides a tool for the spreadsheet-savvy user to enter the new domain of category-based modeling.

Categories in SpreadBase are akin to columns in a table of a relational

*See SpreadBase, Page 50*




**SpreadBase's Report module sets it apart from other data-analysis tools. You can combine text, graphics and data using tools similar to those in a desktop publishing application.**

RATINGS KEY

- ◆◆◆◆◆ *Excellent*
- ◆◆◆◆ *Very good*
- ◆◆◆ *Good*
- ◆◆ *Fair*
- ◆ *Unsatisfactory*

score card

**SpreadBase**

**Objective Software Inc.**
**Overall value** ◆◆◆ **Version tested: 1.01** **List price: $695**

SpreadBase represents the second generation of data-analysis programs. It provides a variety of tools necessary to take information straight from your corporate data warehouse, analyze it, and publish it using text, graphics and tabular data. Its initial release is more or less a shell from which a more robust product will hopefully emerge. Requiring a Quadra-class machine, it is not suited for wide-scale deployment at this time, lacking support for Apple events and publish and subscribe. Its data-management capabilities are severely limited in this release, restricting you to about 4,500 rows of information at any given time, although expanded capacity and improved performance are due in a release later this month. SpreadBase is worth a look, but it needs to grow a bit to handle the data-analysis needs of most medium- to large-size companies.

**Performance** ◆◆ **Ease of use** ◆◆◆
**Features** ◆◆◆ **Documentation/support** ◆◆◆◆

# Turbo 3D is a solid modeler but has its flaws

*Performance offset by unwieldy interface*

**By Timothy E. Johnson**

Turbo 3D is a fast, polyhedral solid modeler and renderer created by Soft'X of Plaisir, France. Although Turbo 3D is new to the U.S. market, it has been sold in Europe for more than eight years; the current version, Turbo 3D 5.0.3, is distributed by View By View and priced at $3,495.

Turbo 3D requires any Macintosh with a floating-point unit, System 6.0.5 or greater, and at least 5 Mbytes of RAM. It uses Rainbow Technologies Inc.'s EVE Apple Desktop Bus hardware key for copy protection.

**Basics.** You can create highly intricate shapes with Turbo 3D's solid modeler. Like all solid modelers, Turbo 3D uses three Boolean tools for sculpting shapes: Subtraction, Intersection and Union. The Subtraction tool carves one shape with another, the Intersection tool creates the common volume shared by two intersecting objects, and the Union tool welds two intersecting masses together.

Turbo 3D allows you to "invert" a solid so that it becomes a void at the center of an infinitely large solid. This, according to View by View, effectively doubles the number of Boolean operations available for any object.

A surface modeler, in contrast, can create shapes only additively, by fusing objects.

Turbo 3D has similar tools for carving surfaces and hollow forms. The program even trims solids with surfaces and can transform surfaces to solids, and vice versa. The only other Macintosh solid modeler that coexists with surfaces so readily is auto•des•sys Inc.'s form•Z (see MacWEEK, Feb. 1).

Turbo 3D is very fast at carving up objects. Zoom, another French solid modeler (distributed by Rebus Technology Inc. of Cambridge,

*See Turbo 3D, next page*

score card

**Turbo 3D**

**View By View**
**Overall value** ◆◆ **Version tested: 5.0.3** **List price: $3,495***

Turbo 3D is a fast, polyhedral solid modeler and renderer with hardware-key protection. Unlike most solid modelers, surfaces and solids can coexist in Turbo 3D, and you can trim solids with surfaces and transform surfaces to solids, and vice versa. Turbo 3D is very fast at carving up objects, but its design philosophy, awkward interface and low accuracy will have you wondering if the speed is worth it. Although it has tools for creating 2-D surface and 3-D solid primitives, eventually you'll end up sowing points in space. In short, Turbo 3D is powerful, but the interface sells the product short.

**Performance** ◆◆◆ **Ease of use** ◆
**Features** ◆◆◆ **Documentation/support** ◆◆◆

**DXF and HP-GL import-export facilitator, $200.*

## Turbo 3D

*From previous page*

Mass.), ties it for first place in speed.

View by View, an architectural-service-bureau-turned-software-publisher, said that Turbo 3D's major strength is its capability to handle design projects of massive scale. It cites commercial complexes in San Francisco and planned "cities" in progress as examples of the application's power.

We were not able to test these claims, but Turbo 3D's design philosophy, awkward interface and low accuracy left us wondering who would want to design a massive project with the software.

**To the point.** Everything is based on the point in Turbo 3D — you can't directly draw a line in this program. To create a line, you must first use the Create Point tool to place two points in space and then connect them with the Create Vector tool. Although Turbo 3D does have tools for creating 2-D surface and 3-D solid primitives, eventually you'll end up laboriously sowing points in space if you want something out of the ordinary.

This atomic design philosophy gives you complete control over your volumes and surfaces, but you pay a price in increased labor and impaired visualization.

Other programs begin at the molecular level by giving you tools to strike curves. These programs let you twist the curves in space to define a surface edge.

By working with curves instead of points, you see your object as you build it, instead of Turbo 3D's approach of playing connect the dots as you manipulate control points.

**The not-so-vogue mode.** Turbo 3D has a tool for papering over your polygonal edges with surfaces, or facets, but it's irritatingly modal. You click on the Facet tool to access the appropriate surface tools that curiously appear in a new menu bar. (You no longer have access to Save, Copy, Paste or the basic modeling commands while you're in the Facet mode — the much-maligned hierarchical menu is better than this.) There are other modal menu bars for transforming polygonal edges into curves and laying out dimensions.

Turbo 3D even forces new modes on your Mac. Under System 7, your desktop disappears when running Turbo 3D. You can get back only by selecting Finder under the application icon. Once you're back on the desktop, you'll notice that the icons for your hard disk and other volumes have disappeared. You get them back by selecting the Hide Others command, also in the application menu. This is all very nonintuitive and indicative of how Turbo 3D has completely turned its back on Mac interface guidelines.

**Reach out and touch something.** Turbo 3D lets you view your model through one window as either an orthographic or perspective projection. Many other modelers show only one drawing window, but they compensate for the lack of other simultaneous views by giving you a large variety of snaps for locking on to your object.

Turbo 3D snaps only to a grid or to points. This forces you to flip back and forth among projections to verify your spatial positions when you are working away from existing points. The program desperately needs snaps for locking on to edges and surface interiors, not just points.

Many tools really operate on points and not lines or curves. For instance, the Clip tool, for trimming one line against another, asks you to click on the endpoints of the intersecting lines. If you don't click on the four points in the correct order, the tool simply won't work. View By View bills Turbo 3D as "an intelligent 3-D general design tool," but trimming lines with endpoints is not intelligent.

Turbo 3D will frustrate you in other areas, too. You must refresh the screen manually to see most of your changes, even when moving between its layers. Fortunately, the program refreshes very quickly. While some 3-D programs offer an unlimited number of layers — particularly important for rendering — Turbo 3D offers only 96. View by View said that because you can split files into many parts, each with its 96 layers, this is not a limitation.



**Pictured is a Turbo 3D rendering with edging turned off. Surfaces can be either transparent, shiny, matte or semimatte. Note the faceted appearance of the surfaces. You must import your model to Pixar's RenderMan to get a smoother look.**

**Performance.** Turbo 3D's speed comes at a loss of accuracy. Any solid modeler needs high accuracy to form a clean intersection from two identical volumes that have a sliver in common. Turbo 3D failed this test by leaving a few stray surface segments of the original objects rather than just the common volume. Less-rigorous testing also showed the problem sometimes appeared after simple carving operations.

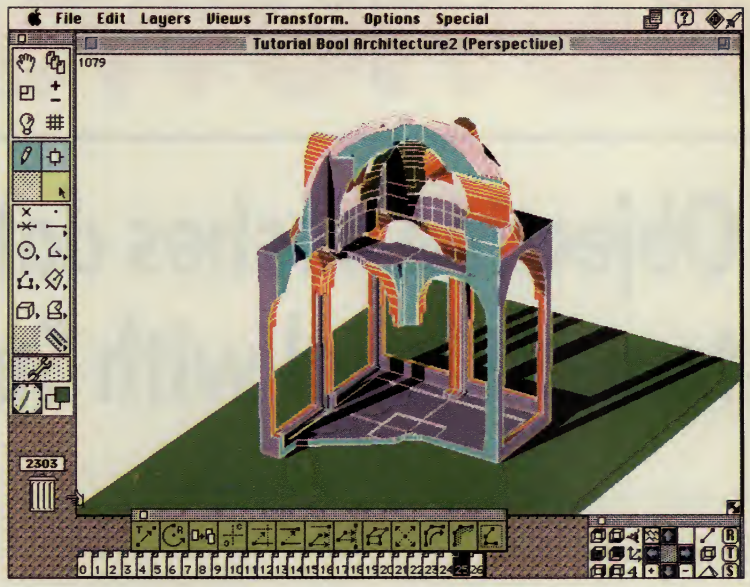
Turbo 3D compromises in other areas. Curves are uniform quadratic B-splines that lack the control of the more popular cubic splines and Bezier curves.

Dimensions use stroked characters, not the Mac's fonts, and you get a choice of only five character sets. Otherwise, the dimensions behave as expected. You can create linear, angular or radial dimensions with tolerances. You can type labels, but we were allowed to use only the bit-map fonts in the system. There is no provision for choosing point sizes other than the specific sizes installed in your System file.

Turbo 3D is also weak in 3-D symbol manipulation. You can only make copies of your symbols. Creating instances isn't possible, which means you can't change all occurrences of a symbol by changing the master. Editing a symbol is a chore. You must place the symbol in your drawing, make the changes, create a new symbol and delete the old version. Other CAD programs let you edit a symbol while it resides in the symbol library. MiniCad+ from Graphsoft Inc., for example, allows you to edit instances on the drawing and make global changes by editing the master; this works with both 2-D and 3-D symbols (see MacWEEK, Nov. 2, 1992).

There are standard tools for creating volumes, with or without rounded edges.

Turbo 3D has tools for extruding outlines into the third dimension, revolving edges into surfaces and drawing tubes out of a 2-D profile along an arbitrary center line. The unusual Embossing tool lets you deform a surface mesh by pushing a cylinder or a sphere into the surface. What is missing is a tool for skinning over cross sections.




**Shown is a nonplanar section taken through a dome carved out of a block using the solid modeling tools in View By View's Turbo 3D. The scene was rendered with several lighting sources, but only one source can cast shadows.**

The program can measure volumes and surface areas.

Turbo 3D has adequate 2-D import and export facilities, but it will cost you an extra $200 to get the more useful 2-D and 3-D DXF (Drawing Interchange File) file exchanger. A separate DXF and HP-GL file exchanger is scheduled to be in the next version at no extra cost.

You can read only PICT files for 2-D imports; 2-D export formats include PICT and Encapsulated PostScript. Turbo 3D imports 3-D information as XYZ files, and it exports surfaces and volumes as XYZ or Pixar's RIB (RenderMan Interface Bytestream) files.

**Rendering.** View By View markets Turbo 3D as a modeler, not a renderer. Nevertheless, the built-in renderer will help you visualize your creations. You can set four distant lights and a sun to any position on an imaginary sphere, but only the sun casts shadows. Any surface can become opaque (with shiny, matte or semimatte settings) or transparent and use any color.

Turbo 3D renders surfaces and volumes as simply shaded, nontextured objects.

Surfaces appear faceted unless you export your model to RenderMan or another renderer for a smoother rendering job. You can add a touch of realism in Turbo 3D by importing a color PICT as a background.

An unexpected bonus is the built-in animator for making walk-throughs along a path. Turbo 3D saves movies in a proprietary compressed format that plays back much faster than QuickTime, providing you can fit your whole movie in memory. You can also save your movie in PICS format.

**Conclusions.** Turbo 3D is a very powerful and fast solid-and-surface modeler that suffers from a terribly awkward modal interface and damaging inaccuracies.

Several tools replace the menu bar with a completely different environment that severs you from common commands, such as Copy and Paste. The program even modifies the desktop in System 7, hiding your hard disk and other volume icons. Soft'X must rectify these disorienting "features" if this program is to gain wide acceptance in the U.S. market.

The low accuracy means simple carving operations will occasionally leave behind stray facets. This detracts from Turbo 3D's strongest point: coexistence of surfaces and solids. You can trim solids with surfaces and transform surfaces to solids, and vice versa. But what good is this if you can't depend on the carving tools?

While the program's speed makes it a contender for architects working on huge projects, the interface is likely to take months to fully master.

We feel Turbo 3D could become a very good, high-speed solid modeler if the interface is redesigned and the accuracy is lifted to the level of its competitors, but we wonder why an 8-year-old product still suffers from these glaring problems.

View By View is at 1203 Union St., San Francisco, Calif. 94109. Phone (415) 775-6926; fax (415) 923-1205. □

**SYSTEM 7 COMPATIBILITY**

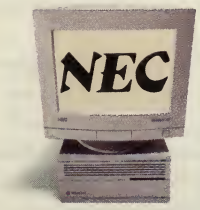
**Turbo 3D 5.0.3**

| | |
|---|---|
| Balloon help | Yes |
| TrueType | Yes |
| Publish and subscribe | No |
| Apple events | No |
| 32-bit addressing* | Yes |

**According to vendor.*




# If you're thinking of buying a Mac monitor, we'd like to offer this note of encouragement.




It's a $100 United States Savings Bond.

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Need an outside opinion? *MacWorld* gave the 3FGx and 6FG their Editor's Choice award. *MacUser* rated 5 mice for the 4FG, and 4 mice for the 5FG and 6FG.




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## SpreadBase

*From Page 47*

database. Unlike a cell within a common spreadsheet, every data element in a category-based matrix can be described by its logical relationship to the rest of your data. Commonly, cells in a spreadsheet are referenced by their absolute address, such as "B5." While you can give a cell or range of cells in a spreadsheet a name, it can quickly lose its meaning when your model is changed.

In SpreadBase, you use relevant terms, such as "hardware purchases for new employees in the first quarter of 1993," to describe a single element of data within your model. Since you are dealing with less-abstract terminology, you can begin to build a better understanding of the information you are working with.

Furthermore, you can rearrange the model any way you please, and the reference "hardware purchases..." will still refer to the same data.

**Matrices and tables.** Models in SpreadBase are composed of multiple "views" of your data, referred to as workspaces. Within SpreadBase's Workspace module, there are three main view types: Table, Graph and Matrix. The Table view presenting data in tabular form is most like a table from a relational database. In this view, each row represents a record in your database. The Graph view presents data in a pictorial format, with a wide range of available chart types.

The Matrix view is the place where you are apt to perform much of your data analysis. In the Matrix workspace, each cell in the matrix represents a record in your database. Using an outlining feature similar to that in Microsoft Excel, you can expand or collapse your model to perform drill-down analyses of your data. You can also easily rearrange your data by moving row-based categories to columns, and vice versa.

There is a third dimension to the Matrix view: You can use multiple sheets to granulate your category-based model further. For example, this would allow you to see all product types on one matrix or quickly break them apart into separate sheet views. You can achieve the same result using a 3-D spreadsheet or workbook, but it would take considerably more time and be much less flexible. Operations throughout SpreadBase are facilitated by the PowerBar — a module-specific tool bar that allows you to create formulas, format data or rearrange your views.

**Getting data in.** SpreadBase can be used to hand-build a database if you are willing to manually input all the data in your model. In most cases, you will want to import data that is stored elsewhere within your organization. The current version of SpreadBase allows you to import data in a limited number of formats, including comma- and tab-delimited text files. We don't feel that these present any real limitations because delimited ASCII files can be created from most database-management systems.

Table workspaces can also be populated directly from your host database using ClearAccess, a data-query tool developed by ClearAccess Corp. This tool can help you perform repetitive updates of your models with data from your host computers. Objective has indicated that additional host query tools, such as Brio's DataPrism, will be supported in (and bundled with) the forthcoming SpreadBase 1.1 release (see story, Page 52).

SpreadBase also has its own Spreadsheet module. This tool is designed to allow you to easily open existing spreadsheet models and convert them to SpreadBase models. With translation technology licensed from DataViz Inc. — the publishers of MacLinkPlus — spreadsheets created by Microsoft Excel 2.2 or 3.0, or files saved in Lotus Development Corp.'s WK1 format used by Lotus 1-2-3 can be imported directly into the Spreadsheet module. Objective is working with DataViz to add support for additional import and export formats and expects to offer Excel 4.0 and DBF files in Version 1.1.

It is important to note that SpreadBase is best suited to structured data. Spreadsheets are often used to create unstructured models, and importing these into SpreadBase will present a few challenges.

**Graphing and reporting.** SpreadBase offers a capability not found in any other data-analysis tool — the ability to publish compound reports. The Graph view can be used to create a variety of business graphs to help portray your model. These graphs, in conjunction with text and tabular data, can be laid out using SpreadBase's Report module to produce high-quality reports. The reporting module provides many familiar object-oriented drawing tools, allowing you to embellish your reports with lines, boxes, color and other elements.

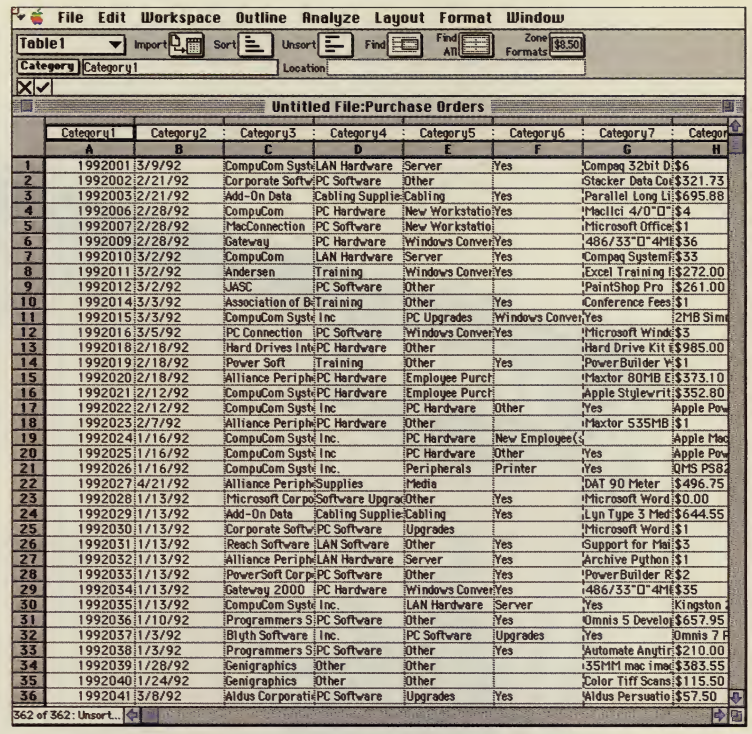
One area where SpreadBase is noticeably lacking is in System 7 support. The current release supports neither Apple events nor publish and subscribe. This makes it difficult to use SpreadBase in conjunction with other tools, especially on a network.

In some cases, we would prefer the option to tie in a more-sophisticated graphing tool, such as DeltaPoint Inc.'s DeltaGraph Professional, without going through the time-consuming process of exporting the data every time a model changes.

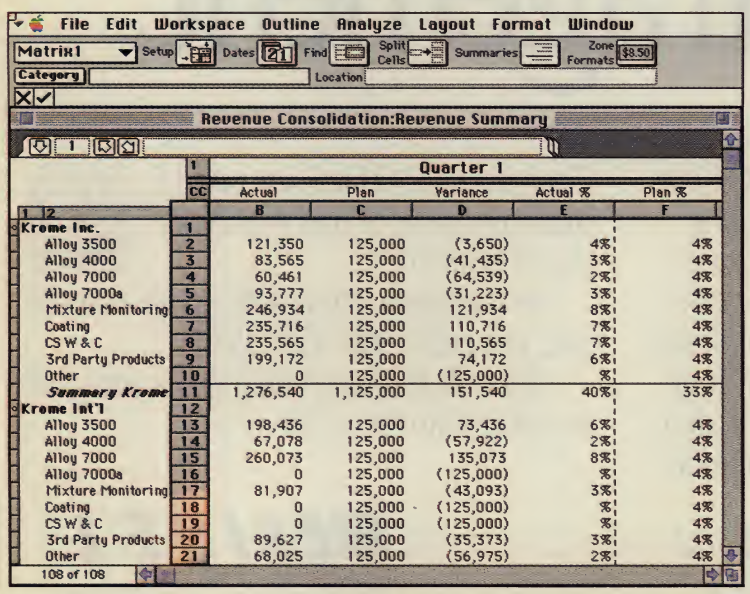
Also, because of its hefty system requirements, SpreadBase is a tool we would expect to see on just a few desktops within an organization. In this scenario, we would envision others wanting access to information "published" by SpreadBase. Until Objective adds support for these System 7 features, this integration and sharing will have to be performed manually.

**ModelTalk.** The Macro module is based upon ModelTalk, SpreadBase's programming language. SpreadBase macros are unlike those that can be written in Excel or Lotus 1-2-3 in that they offer no control over the user interface. They are

*See SpreadBase, Page 52*




**The Table workspace is where you can view all or subsets of your data in a row-by-row representation. You can use category-based formulas to derive new columns (or categories), manually enter them, or import new data from an external source.**




**Matrix workspace is where you perform the bulk of your data analysis. From this view you can easily rearrange the categories, derive new categories and create new views.**

### How SpreadBase stacks up against the competition

Objective Software Inc. touts SpreadBase as the first category-based modeling tool for the Macintosh, but is it? During the past year we have examined a variety of data-analysis tools, including Occam Research Corp.'s MUSE (see MacWEEK, Feb. 24, 1992), Brio Technology Inc.'s DataPivot (see MacWEEK, Feb. 17, 1992) and Cognos Inc.'s PowerPlay (see MacWEEK, May 11, 1992).

All these products, including SpreadBase, employ a spreadsheetlike interface for performing matrix analysis on a clump of data. Even Microsoft Excel includes an add-in, the Crosstab Report Wizard, that can be used to perform rudimentary data analysis similar to that done by the dedicated tools mentioned here.

SpreadBase is different from the rest of these products — although in some cases, these differences are more subtle. All the dedicated data-analysis products, although geared to perform a similar function, differ in their sophistication, breadth and ease of use.

DataPivot is an interesting tool that is easy to use. You can quickly analyze information using DataPivot, but it lacks the database foundation of products such as MUSE and SpreadBase. PowerPlay is not so easy to use, especially when it comes to writing scripts to capture information for your model. It also lacks a database foundation for storing and maintaining the relationships among the data elements contained within your model.

The lack of a database foundation, therefore, points to a key differentiation between these data-analysis tools. Going further, when one compares tools that can be cast in a similar light — MUSE and SpreadBase — some of the differences are minor. Since they both are built with a relational database foundation, the concept of category-based modeling could be extended to both products.

MUSE has a unique, English-like query interface that you can use to both define relationships within your model, as well as ask questions about the data stored in the database. SpreadBase does not offer an even remotely similar construct, yet it excels in many areas where MUSE is deficient — chiefly reporting flexibility and general ease of use.

None of these data-analysis tools is easy to get started with quickly. SpreadBase introduces some new concepts in its worksheet and module interfaces and polishes the concept of category-based modeling with consistent terminology to back it all up.

Getting data into your model is one of the linchpins to effective data modeling. Each product has its nuances in this area. DataPivot is obviously well-integrated with DataPrism, Brio's query tool. ClearAccess Corp.'s ClearAccess and Apple's Data Access Manager are other popular tools that provide similar function. With the technology relationship between Brio and Objective, this should push SpreadBase further along in this area.

SpreadBase represents the second generation of data-modeling tools by virtue of its attention to detail and well-thought-out implementation of its category-based modeling vision. Its ability to create compound report documents that are hot-linked to the data in its database is a new feature that really sets it apart from the rest of the field. — By Jonathan A. Oski

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## SpreadBase 1.1: Vision becoming a reality

While we were preparing our review of SpreadBase 1.01, Objective Software Inc. was working hard readying an upgrade to SpreadBase that addresses many of our current criticisms. Version 1.1, due to ship later this month, focuses on beefing up some of SpreadBase's current deficiencies.

To enhance data access, Objective Software has formed a joint technology agreement with Brio Technology Inc. to provide close integration between SpreadBase and DataPrism, Brio's data-access tool for Microsoft Windows and the Macintosh.

Unique to this approach is a feature called Structured Data Objects. This mechanism maintains a link between the source of the data and the SpreadBase model, easing subsequent importation and updates to data stored in the model. These same links are not easily established and maintained using current spreadsheet technology.

Objective will be bundling DataPrism 2.1 with SpreadBase 1.1 to offer a more complete data-analysis solution.

The data-handling capacity of SpreadBase 1.1 will triple that of 1.01, to close to 12,000 records. From our perspective, this limitation is one of the biggest weaknesses of the original version. The current limitation of 4,500 rows will quickly stymie the use of SpreadBase as a modeling tool when many detail records are involved. Version 1.1 will address this limitation head on, making it feasible to import more data into your model.

Still, this is an area that we think needs additional attention. In many instances, you will need data-handling capacities of 100,000 rows or more to model historical or projected trends at a line-item level of detail.

Objective also promises that the new release will use memory more efficiently, thereby allowing you to manage 12,000 rows of information in close to the same space as is currently required for 4,000.

This upgrade should help solidify much of the vision portrayed in the initial release of SpreadBase, but further improvements in both data handling and ease of use will still be necessary if this product is to set a new standard for data-analysis tools. Lotus Development Corp. is in a similar position with the recently released Improv for Windows, a data-analysis tool that is also based on the spreadsheet concept.

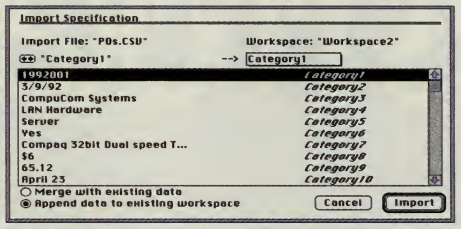
As these products cross platform boundaries, the battle for this market space should heat up.
— By Jonathan A. Oski

## SpreadBase

*From Page 50*

more akin to functions or subroutines that can be referenced in category-based formulas used throughout a model. The fact that they cannot control the user interface does not diminish their power. ModelTalk is a rich language that allows you to extend the functions in SpreadBase to perform a variety of conditional and nonconditional operations and return a value to the calling formula.

However, SpreadBase is not a product that you can deploy within your organization with a carefully tailored interface. In this sense, it is unlike MUSE, which allows you to create scripts that can be used to automate and tailor operations such as querying and reporting from its database. SpreadBase will be most appropriate for highly skilled knowledge workers within your organization. It is not a tool that you are likely to deploy to senior managers to view and absorb the models that you have constructed. Should Objective add a scripting interface or Apple-events support to SpreadBase, this deficiency could be mitigated.




**SpreadBase allows you to import delimited ASCII files as well as common spreadsheet formats. Using this interface, you can browse through the data before it is loaded into your Table workspace.**

**Performance and limitations.** SpreadBase is a young product. The current release cannot realistically handle much more than 4,500 records without a noticeable degradation in performance — even on the high-end Macs. We tested the product in memory partitions up to 15 Mbytes and still noticed these limitations. Version 1.1 of SpreadBase, which Objective hopes to ship later this month, will reportedly triple the data capacity of a model, but this may still not be enough for many organizations.

Data importation can also be slow. In our tests, it took up to 15 minutes to import 5,000 records.

Because SpreadBase is a memory-based application, these limitations will be governed to a large degree by the amount of memory available in your Mac. Although you can add data to the model in an incremental fashion, it is still likely to be a time-consuming process. Objective will have to improve these times because it is apt to be a task that is performed frequently.

**Support.** Objective offers a SureStart program to help educate people with respect to the use of the product. This partnership program combines the product with two to five days of on-site training to help you get started building models with SpreadBase.

This approach is important for a number of reasons. Primarily, those who choose SpreadBase now are buying Objective's vision for SpreadBase rather than a final product. It clearly has some areas that need improvement before it can achieve this vision, but by becoming familiar with the product early on, you will be in a better position to make use of its analytical capabilities when it is a more robust product.

Learning to use SpreadBase is influenced by your background with analytical tools. If you are accustomed to using relational databases, much of SpreadBase's underlying database architecture will be easy to pick up. Spreadsheet users may not find it as easy to pick up because of the way models are constructed and the new category-based way of thinking. The SpreadBase interface will look familiar, but formulas are wholly different than those in spreadsheet applications.

Objective includes a Getting Started guide and a MacroMind Director presentation from Macromedia Inc. to help you get going with SpreadBase. After that, you will have to rely on the User Reference and ModelTalk Reference manuals to guide you through the process of developing models.

These manuals are adequate, but you will need some imagination, and help from Objective, to build complex models. The SureStart program is key to helping you get started and avoiding wasting time familiarizing yourself with the new environment embodied in SpreadBase.

**Conclusions.** SpreadBase is a functionally rich product that needs to grow for it to be a truly useful data-analysis tool. Objective Software is cognizant of the product's current limitations and hopes to continue to add functionality and improve the product's performance.

At least two updates are planned before the end of the year, which should address several concerns.

The market for data-analysis tools is a difficult one. We have watched Occam Research, a company with a strong product, fade into obscurity in the past year. One can only hope that SpreadBase will be able to achieve the critical mass necessary to sustain the product until its vision is realized and users can take advantage of its power without today's limitations.

Objective Software Inc. is at 200 Chesapeake Drive, Redwood City, Calif. 94063. Phone (415) 306-7400; fax (415) 306-7404. □

**SYSTEM 7 COMPATIBILITY**

| SpreadBase 1.01 | |
|---|---|
| Balloon help | No |
| TrueType | Yes |
| Publish and subscribe | No |
| Apple events | No |
| 32-bit addressing* | Yes |

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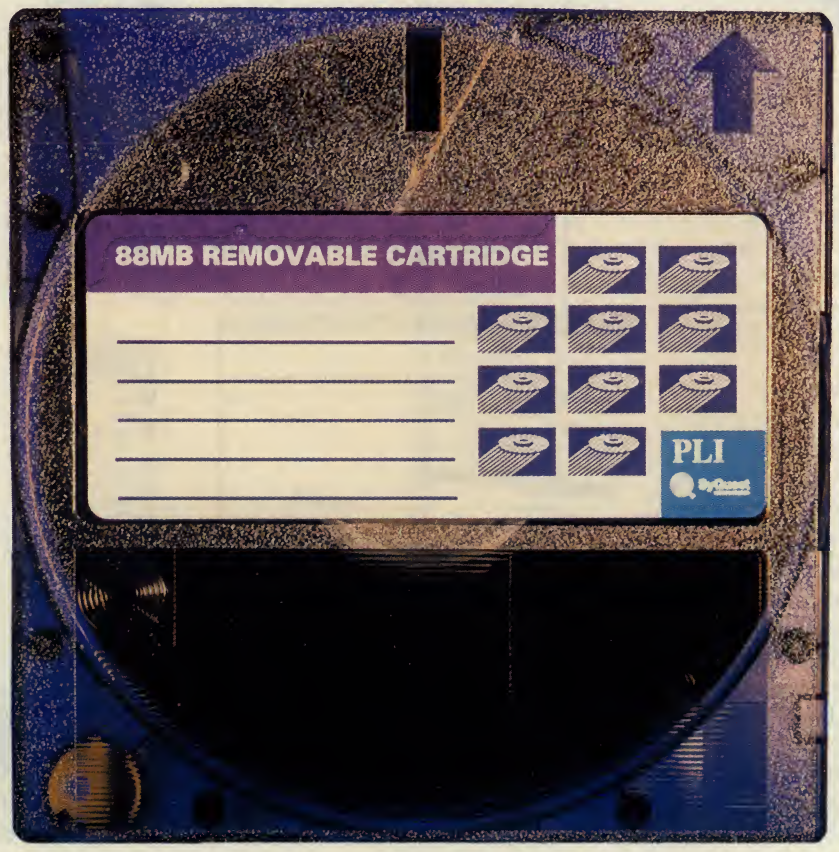
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# Multi-Ad Creator speeds up single-page layout work

*Special-purpose tool automates advertising layout and production.*

**By Steve Hannaford**

Multi-Ad Services Inc.'s Multi-Ad Creator, now in Version 3.5.2, is a special-purpose page-layout program packed with features for creating advertising layouts. With this product, Multi-Ad Services has learned a few tricks from the major page-layout software vendors and has come up with a few of its own. The most remarkable benefit is speed: This is a true power tool for the professional.

The $995 program has extensive drawing tools, but its strength is in quickly designing, laying out and filling rectangular ad spaces. It differs from other layout programs primarily in that it is not designed for multipage documents, although it makes up for missing features with ones more crucial to the task of building ads.

Upgrades from any previous version of Multi-Ad Creator are $149.

The application includes a wide variety of standard ad shapes and dimensions, including both Standard Advertising Unit (SAU) and Television Magazine Advertising Unit (TMAU). This program is also useful for building any other single-unit design that incorporates type and images, such as business cards, fliers or stationery. You can create your own custom ad sizes and have them appear on a menu.

**Productivity enhancers.** The real advantage of Multi-Ad Creator is in features for speeding up often-repeated work. The user can save elaborate preferences, including the start-up interface, color settings and units of measure. (The program supports increments as small as 0.001 point for scaling, leading and kerning.)

Multi-Ad Creator's Stationery files are templates with preset text and graphics that allow you to make numerous layouts for the same basic file. Using the Stationery feature, you can make a number of different ads for different space requirements based on different publications' needs, or compose several versions of the same ad.

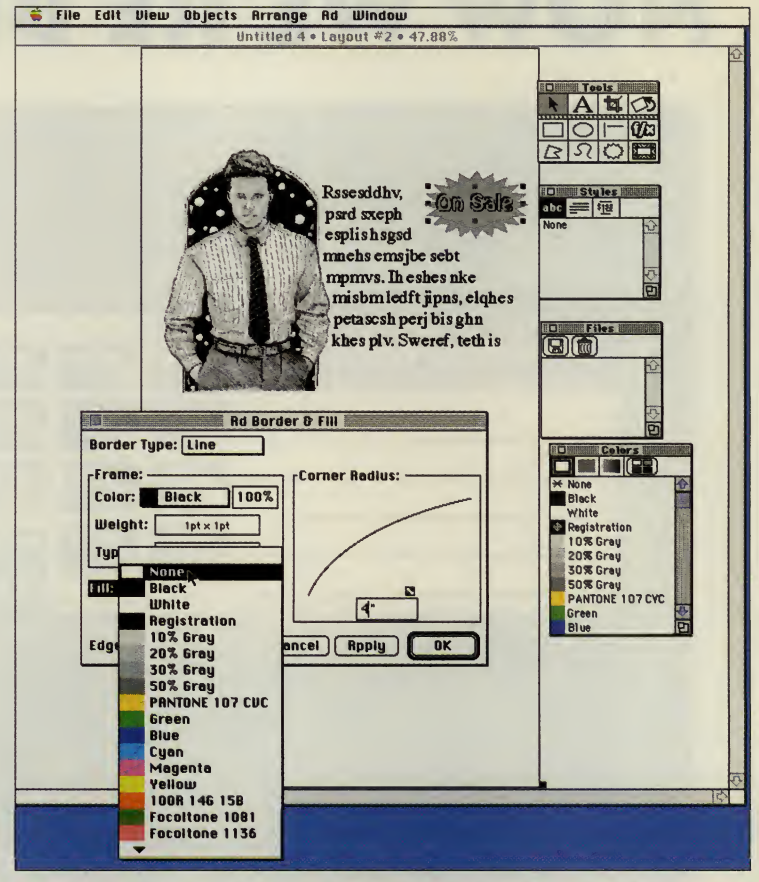
You can name and save style sheets for type and paragraph formats. Multi-Ad Creator's Style Models allow you to automatically create a complex text block with an elaborate pattern of styles. In a newspaper grocery ad, for example, there are often numerous formats within a single block, including specific typefaces, sizes, baseline-shift parameters, special kerning and leading; an ad may repeat the formatting in this block many times.

You can create a script for this setup automatically, save it as a Style Model, and reuse it for a dozen or a hundred other similar text blocks. Setting up Style Models is by no means simple, but once constructed, they can speed repetitive work enormously.

**Layout features.** While Multi-Ad Creator offers basic drawing tools, you will generally want to import graphics from other applications. The program lets you place graphics in Encapsulated PostScript, TIFF, PICT and RIFF formats. These can be placed anywhere inside the ad area, page or work space. You can resize, crop, rotate and layer the graphic elements. The free-rotation tools work speedily with texts and objects.

You can import text into text boxes, and there is a provision for having text spill into an array of text blocks. The procedure is a bit complex, but it is possible to import a single product list into separate ad boxes so that orig-

– *See Multi-Ad, next page*




**Multi-Ad Creator is specially tuned for building ads quickly. The Border & Fill tool lets you use a wide variety of prebuilt fills and border styles, and you can also create your own.**

*score card*

**Multi-Ad Creator**

**Multi-Ad Services Inc.**
**Overall value** ◆◆◆◆ **Version tested: 3.5.2** **List price: $995***

If you create advertisements on a regular basis, and quick production is important, you need this precise and feature-rich program. While easy to use on the surface, Multi-Ad Creator is a remarkably deep program with all kinds of specialized features aimed at its specific audience. New features in this version include a fast Automask tool and expanded color-gradient choices. Most of all, Multi-Ad Creator is geared for a high-throughput environment.

**Performance** ◆◆◆◆◆ **Ease of use** ◆◆◆◆
**Features** ◆◆◆◆ **Documentation/support** ◆◆◆◆

**Upgrades from previous version, $149.*

## IN BRIEF



### PowerLink Presentor

*Compact design opens Duo to audio, video connections*

Apple's introduction of the Mac PowerBook Duo series last October left many users anxiously awaiting the arrival of third-party docks. The first of these products to be widely available, the PowerLink Presentor, enables a Duo to connect to a wide variety of monitors, including many Macintosh-compatible displays, Super VGA monitors, LCD panels, and television monitors in both NTSC and PAL (European) formats.

The Presentor was originally developed by E-Machines Inc., but the manufacturing and distribution rights to the product were recently acquired by SuperMac Technology Inc. (see MacWEEK, March 1).

Currently, E-Machines still manufactures the Presentor, and it is sold by SuperMac under the E-Machines label, but representatives of both E-Machines and SuperMac said that SuperMac may eventually take control of production.

The Presentor can run a variety of different-size Macintosh monitors at various pixel depths, from a 12-inch monitor at 256 colors, up to a 20-inch monitor at 16 colors. Television output is limited to a resolution of 640 by 480 pixels and 256 colors.

**Duo dock.** With a list price of $499, the Presentor is designed to be the ideal second dock. Its audio and video capabilities make it well-suited for business presentations on the go.

The Presentor includes several other ports to complement the video output, including a connection for an external floppy drive, a monaural audio-out port, and an Apple Desktop Bus port for an external keyboard and mouse. In addition, the docked Presentor does not cover the Duo's internal serial port or modem connector, so they remain accessible while the Presentor is in use.

Weighing only 10 ounces and not much larger than the Duo's AC adapter, the Presentor is very portable. Included with the dock is an adapter to connect a VGA monitor and a cable needed to attach the Presentor to an RCA-equipped television or VCR. While about only 20 percent of commercial televisions are equipped with RCA inputs, nearly all VCRs are. To hook up to a television with no RCA inputs, an RF modulator is required, which can be purchased for about $15 at many electronics stores.

Unlike the Apple MiniDock and RasterOps Corp.'s DuoMate — which both extend beneath the Duo, providing the same tilt as offered by the Duo's extendable feet — the Presentor reduces bulk by simply snapping onto the back of the Duo, extending back three inches. However, this compactness

*See Presentor, next page*

## Multi-Ad

*From previous page*

inal text can be created in Microsoft Word, Claris Corp.'s MacWrite, or in ASCII or RTF format outside the program.

The layout of a page is quite simple and straightforward. Objects are simple to move and bring to front or back, and there are elaborate tools for alignment, centering, relative spacing and snapping to guides. You can quickly print a "rough" with a full description of each object on the page and an outline of its location.

**Borders and objects.** Multi-Ad Creator provides drawing tools, especially for making boxes and fills, that operate like those found in most drawing programs. There are tools for creating gradients inside the boxes, with a number of controls over direction, starting point and rate of change. You can create drop shadows for any object or set of objects, in any direction, with any amount of offset.

A wide variety of premade borders, including simple dotted lines for coupon creation and whimsical decorations such as Egyptian scrollwork, let you spruce up your frames. You can adjust the weight and color of the borders as you like, and the package includes a border editor so you can make your own.

One of the ad-specific objects offered is the Star Burst, which is great for those little messages proclaiming "New and Improved!" or "95% Fat Free." You can edit the size, shape, number of points and the relationship between the specific points as you choose. After star bursts and other shapes are created, they can still be reshaped. Tools for creating polygons, lines and circles are also provided.

Any graphic object can be masked. If you import a TIFF image of a head of lettuce, for example, a single command places a mask around the head of lettuce so the telltale white bounding box disappears. You can control the granularity of the mask to get maximum accuracy while simplifying the PostScript path enough to make it printable. The lettuce shape can then be placed on top of any background. This is an automatic feature unique to Multi-Ad Creator.

Version 3.5.2 also includes trapping features. You can choke or spread colors on an object-by-object basis and specify whether objects will overprint or knockout.

**Text control.** Multi-Ad Creator offers elaborate and excellent type handling, including precise control over kerning, leading, tracking, word spacing, hyphenation and baseline offset. It also provides a spelling checker.

The program allows you to fit text automatically to a text box and flow text easily around or inside irregular shapes. Multi-Ad Services has also thought through the problem of setting up tabbed text to facilitate making formatted price lists, for example. The package includes dozens of special PostScript effects, from curved type to effects called Back Shadow, Neon and Venetian.

**Color and printing.** The current version has full-blown controls over color. You can create your own color palette from a variety of sources, including Apple's color picker, Pantone and Focoltone — but not Trumatch. You can specify colors as spot or process to begin with, but you can substitute process colors for spot colors at printing time.

The print dialog gives elaborate control over such esoteric options as UCR (undercolor removal), black generation, screen frequency, screen angle and total ink coverage. It is even possible to make adjustments to each color plate.

You can make use of a variety of supplied PostScript Printer Description files before creating the printable file. Crop marks, registration marks, color bars and notes can be included on the output. Setting a Smoothness threshold makes it easier to print otherwise unmanageable PostScript paths.

**Details.** There is not much we can find wrong with Multi-Ad Creator. The elaborate PostScript features may lead some users to create virtually unprintable files, and controls over many experts-only features may lead some novice users into dangerous territory, but Multi-Ad Creator has few detectable problems.

Although it creates Desktop Color Separation (DCS) files, the program cannot import them. As a result, many users comfortable with making DCS separations in programs such as Adobe Photoshop may be forced to change their ways.

There is a lot to learn with this product. The manuals (a User's Guide and Reference Manual) are solid and quite clear. The program's interface is a little cluttered but easy to navigate.




**"New and improved"-style borders, star bursts, distorted type and other features are fast and easy to make in Multi-Ad Creator. Power tools are more difficult to master.**

**Conclusions.** Multi-Ad Creator is not going to replace Aldus PageMaker or QuarkXPress for normal desktop publishing of multipage documents. However, if you create display ads or other highly formatted one-at-a-time pages as a major part of your business, you need this product. In fact, it would be surprising if you were using anything else. Multi-Ad Creator has all the virtues of a well-honed tool with a specific end in mind.

Multi-Ad Services Inc. is at 1720 W. Detweiller Drive, Peoria, Ill. 61615-1695. Phone (309) 692-1530; fax (309) 692-5444. □

## Presentor

*From previous page*

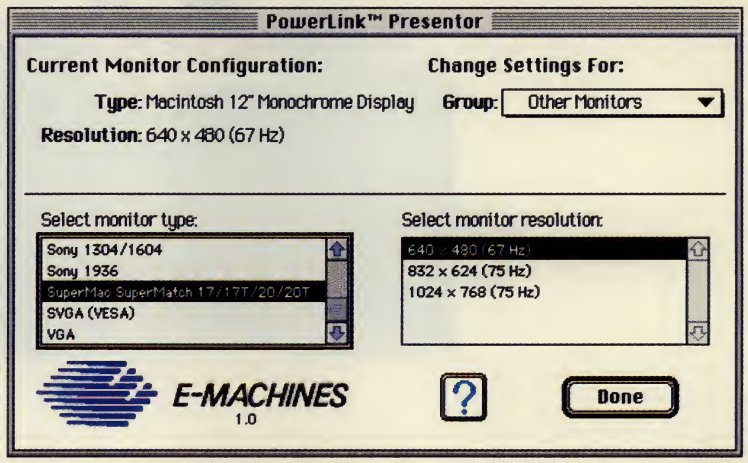
comes at the price of reliability. As a result of this design, the docking connection is less stable than that of the other minidocks, and jarring a docked Presentor will often freeze up the Duo with an unrecoverable bus error.

**Presentor performance.** Setup and installation of the PowerLink Presentor are simple in theory but can be perplexing in practice. Run the installer program, then restart your Duo with the Presentor and monitor attached and you're in business. If you use an Apple-supported monitor, the Presentor will provide the proper video signal when you start up your Duo. However, to attach a third-party monitor, you must then open the Presentor software, select the monitor type and restart again. Making that monitor the main monitor requires yet another restart.

Monitor preferences are stored in flash memory inside the Presentor. This is an advantage if one Presentor is to be used under the same configuration by several different Duos, but because of the software's need to have access to the flash memory, the Presentor's configuration does not allow the user to set preferences ahead of time; indeed, the program will open only if both a Presentor and monitor are currently attached to the Duo. In practical terms this means that the user should allow at least 10 minutes before a presentation for setting up at a new configuration.

Once configured, the Presentor performs flawlessly. With speeds virtually identical to those of Apple's MiniDock, using a Presentor-driven monitor is indistinguishable from using a monitor attached to a desktop machine. In addition, the Presentor supports hardware panning and zooming, with panning speeds limited more by the speed of the mouse than that of the hardware.

The Presentor's performance when hooked up to a television monitor is much better than that of most video cards with television capability. Within the Presentor, E-Machines implemented its own proprietary convoluting technology, which greatly reduces the flicker that plagues most television-computer connections. However, since this feature utilizes more of the video RAM, it cannot be used in conjunction with the hardware panning and zooming, a small price to pay for the increased clarity.




**The configuration software for SuperMac's PowerLink Presentor allows you to hook the dock to a wide range of third-party Mac monitors, VGA displays and televisions.**

**Conclusions.** The PowerLink Presentor does what it says and does it well. After playing with it for a while, configuring becomes second nature, and you learn not to use the Presentor in your lap, for fear of crashes. Experience will teach you the nuances of the setup procedure that go beyond the bare instructions given by the manual. SuperMac is examining the problem with the Presentor's latch and said that an improved latching mechanism is under consideration and may be implemented in the future.

SuperMac Technology Inc. is at 485 Potrero Ave., Sunnyvale, Calif. 94086. Phone (408) 245-2202; fax (408) 735-7250. — *By Kevin Fox*

**SYSTEM 7 COMPATIBILITY**

| Multi-Ad Creator 3.5.2 | |
|---|---|
| Balloon help | Yes |
| TrueType* | Yes |
| Publish and subscribe** | Yes |
| Apple events | Yes |
| 32-bit addressing*** | Yes |

**PostScript special effects only with PostScript fonts. **Subscribe only.*
****According to vendor.*

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# BBS products provide links to outside world

*Managers are turning to the wide range of on-line connections in stand-alone bulletin board products to enhance their traditional E-mail systems.*

**By Mitzi Waltz**

Businesses have multiple communications needs today, and internal electronic mail alone is not enough to address them all. Those in charge of complex communications operations have a simple plea: Can't all of the bulletin board, E-mail and other on-line functions be integrated, if not in a single product, at least by way of a single product?

Managers are finding one solution to this problem in stand-alone bulletin board products that can access a wide array of services many corporate sites need for their business.

These products help managers communicate more effectively with customers, staffers working at home or on the road, and other businesses. Deciding which product is right for your business depends on how you need to enhance your conventional E-mail system.

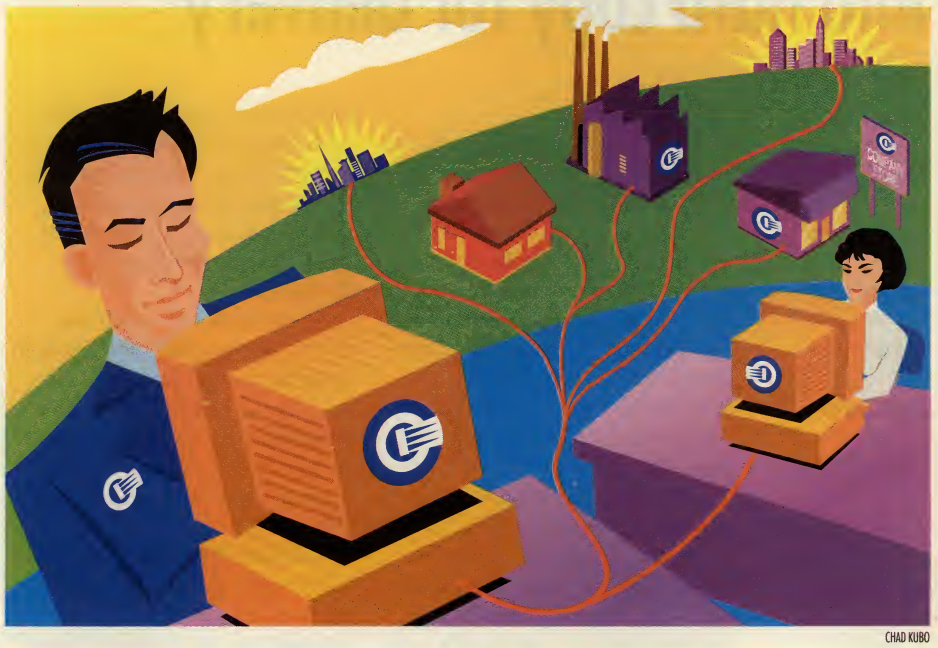
**All-inclusive communications.** While there is still no one-stop solution, FirstClass from SoftArc Inc. comes about as close as you can get. This communications product began life as a Mac-based bulletin board system package with a graphical user interface. In its newest incarnation, FirstClass has metamorphosed into a BBS/E-mail/conferencing/remote-access tool.

Jack Ranieri, manager of customer support for Toronto-based TSB International Inc., which specializes in telecommunications management products, said FirstClass makes keeping everybody in touch much easier.

"We have an office in England, and we weren't communicating very effectively," he said. "Now we use the gateway to send E-mail to England. It's more productive — and less expensive — than placing a phone call or even sending a fax." A third office in Australia will soon be on-line as well, he added.

A Mac SE/30 with a 14.4-Kbps modem functions as Ranieri's communications server, incorporating internal E-mail, a Toronto-to-England gateway, a customer-service BBS and a remote-access gateway in one Mac.

"Our customers can call in and acquire technical-support notes, product information and price lists," he said. "And for people working at home, they can actually work on-line if needed. There is an upload-download process for some things, like mailing large documents to someone, but you can set it up in advance."



CHAD KUBO

The FirstClass Mac is an integral part of TSB's AppleTalk network, so using the E-mail function is as simple as choosing a new server and double-clicking, Ranieri said.

"I spent only half an hour doing corporate training [on FirstClass], and now everybody's using it," he said. The company is looking into using FirstClass' Internet support as well, he said.

**Simple BBS building.** Although vendor ResNova Software Inc. doesn't recommend replacing your office E-mail system with its just-released NovaLink Professional 3.0, it can link seamlessly with CE Software Inc.'s QuickMail.

Additional mail gateways for FidoNet (the most widely used "hobbyist" mail-delivery system) and the Internet, as well as for communications over TCP/IP and X.25 networks, are also available at a reasonable cost.

Remote users can bypass AppleTalk Remote Access (ARA) hookups, checking their in-house E-mail and uploading documents via NovaLink instead.

The system features multiple levels of security, and if several modems are used, a single Mac can easily accommodate several on-line users simultaneously.

Thanks to its modular design and support for externals, managers can use NovaLink Professional to configure a simple sup-

*See E-mail, next page*

## Internet access available from many sources

One of the greatest attractions of BBS-style interoffice communications systems is their potential to link in-house users with communications methods and information resources outside the office.

With built-in Internet hookups, sending mail to addresses on the Internet can be as easy as sending a message down the hall. In addition, companies can use some of these links to bring in Usenet news-group files that relate to their field of business.

But BBS-style packages are not the only option for linking your office with the world via the Internet. Most up-to-the-minute traditional E-mail software now provides links with commercial on-line services, such as CompuServe, GEnie or MCI Mail. Through accounts on these services, mail can be routed to the Internet and, through it, on to other on-line services, such as The Well.

Although the addressing conventions can be a bit arcane, occasional use of this routing method is less expensive than building in an in-house Internet connection if messaging volume does not warrant one.

America Online asks no extra charge for Internet delivery, but messages can be no larger than 32 Kbytes. Mac AOL users can't receive messages from Internet addresses that are larger than 27 Kbytes, and users of IBM PCs and compatibles are limited to 8-Kbyte mail.

CompuServe users must use the ASCII format for their Internet messages, which are limited to 50,000 characters both ways. The service levies small charges for receiving Internet mail: 15 cents for the first 7,500 characters and 5 cents for each additional 2,500 characters.

GEnie users must register in a special Internet mail area, and there is a small per-message surcharge.

Permanently cementing links to the Internet requires a leased line, at a cost of $300 to $700 per month, and a router, which can cost $3,000 or more. In addition, you'll have to pay fees to a service provider, such as Colorado SuperNet, to upload and download your mail.

Much less expensive are dial-up connections over regular or high-speed phone lines, to instantly deliver mail in the SMTP (Simple Mail Transfer Protocol) format. There are two methods used to do this: Serial Line Internet Protocol or Point-to-Point Protocol.

Dial-up Internet Protocol requires either a hardware router or a host-service account, which can cost about $100 to $250 monthly.

Companies can also contract with services that specialize in providing Internet access to corporate customers. HoloNet from Information Access Technologies Inc. gives Mac users a simple, menu-driven system for access that can be linked with several E-mail systems. For a minimum charge of $6 per month, which is applied toward hourly charges of $2 to $4, subscribers can send and receive mail and files.

Information Access Technologies also provides subscribers with Eudora, a freeware off-line reader that can save money by limiting connect time. Like commercial on-line services, HoloNet offers local phone numbers from most major U.S. cities.

InterCon Systems Corp. can also provide corporate Internet service via its WorldLink Basic Service and WorldLink Lite. Basic service provides unlimited mail transfers plus 50 Mbytes of news and other FTP transfers monthly for $29 to $39, depending on modem speed.

The Lite version offers mail access only for $19 to $29. InterCon sells several software packages that give Macintoshes support for various communication profiles.

— By Mitzi Waltz

# The paper chase: Turning E-mail into hard copy for delivery

*Sending faxes, telexes and letters across the country or around the world is fast and easy with alternative E-mail services.*

**By Mitzi Waltz**

Now that your company is on-line, you should be able to send mail to anybody who's anybody, right?

Wrong — there are still times when your intended recipient will not have an electronic address, or when electronic mail just won't do. For these special cases, commercial E-mail services offer somewhat more prosaic options: delivery by fax, telegram, mail, overnight courier or telex.

According to CompuServe Inc. representative Dave Fishler, some companies make frequent use of paper-delivery options. "In some cases, they use them for overseas communications — especially with telex, which is probably more prevalent in Europe than in the United States," Fishler said. "The fax service is also very popular and is used both by companies and individuals. It's quick, easy, and CompuServe does provide a receipt."

Fishler noted that companies can save money because, regardless of where the fax is going, there will be no charge for a long-distance call.

CompuServe, like its competitors, does levy extra charges: In the case of fax transmission, it is 75 cents for the first 1,000 characters, more for additional characters. CompuServe also limits postal wires, another hard-copy option that's similar to a telegram, to 219 lines.

**Easy to choose.** General Electric Information Services' GEnie also provides fax and mail services, as does America Online Inc. As with all of these on-line services, choosing a delivery method is as simple as addressing a message.

When composing their mail on- or off-line, users simply choose from a menu of alternative-delivery options. Prices for each method are available on-line, and they are pegged to the length of the message and/or its destination (domestic or overseas).

MCI Mail ups the alternative-delivery ante by adding courier delivery to the mix. "If the recipient has to have hard copy and it has to be overnight, we hand off a printout to an overnight service like Airborne or Federal Express," said Jane Levine, MCI Mail public-relations representative.

Companies choose a delivery system based on what the recipient's equipment is on the other end. For example, telex is common in the shipping industry, import-export businesses dealing with less-developed countries where telex is the state of the art, and the banking industry. Telex's appeal in these businesses has more to do with legal status than bps rate.

"Telex is the only electronic delivery system that's actually been tested in a court of law and held up," Levine said. "It's admissible [as legal evidence] because of its answer-back feature, which lets you confirm the message was sent and to where."

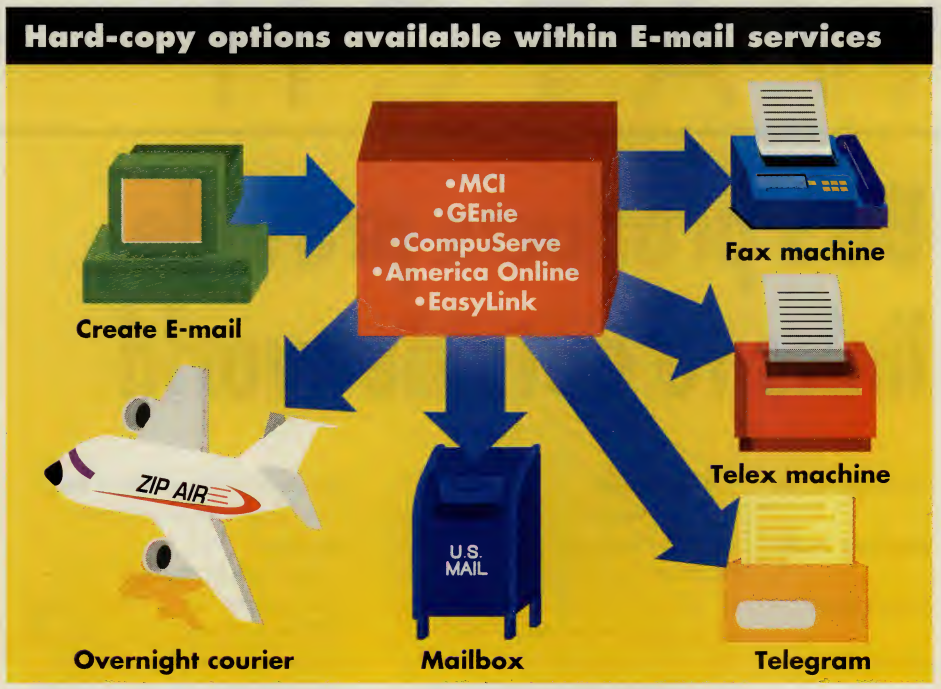
MCI even translated E-mail into telegram form at one time, although it has since discontinued the service; according to the company, it wasn't very popular.

Several MCI customers rely heavily on these methods. The Seattle-based department-store chain Nordstrom Inc., for example, maintains a worldwide E-mail network based on MCI Mail.

According to Randy Rehn, Nordstrom communications specialist, when linked with an in-house database of vendor information via proprietary communications software, MCI Mail offers staffers at the chain's headquarters delivery options that can get E-mail to even the most obscure of its suppliers.

AT&T EasyLink Services, while not as well-known in the Mac world as some others, also offers fax, paper, telex and U.S. Postal Service delivery options. The company's Access III software, which will soon be replaced by an even more advanced package, can link Macs into AT&T's worldwide E-mail network with a familiar-looking interface.

EasyLink also provides broadcast-fax capability, a feature that lets companies automatically deliver one electronic document to hundreds of fax addresses, if desired. □



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## E-mail

*From previous page*

port BBS or a complex communications system by moving folders and icons around on the screen. With NovaLink's built-in special features, the system can let users (local or remote), customers and suppliers send and receive mail, browse product support files, download software, and even shop for hardware or other items on-line through a new catalog-style Product Libraries feature.

At US West Inc.'s Denver facility, technical-staff member Frank Martinez is adding a NovaLink Pro setup to replace the telecommunications company's old help-desk equipment and link remote workgroups. His 36-line system includes four TCP nodes and links to a number of US West sites via the Internet.

"We have applications and networks scattered throughout 14 states," Martinez said. "When an equipment failure occurs, the telephone network managers need to know immediately so they can reroute calls. We also have some other things [on-line], including a newsletter to keep everybody in contact." The company already had a corporatewide E-mail network with X.400 resident gateways, so there was no need to link the two for wider mail distribution.

Customer support was the key for Mike Myers, technical consultant for Linographics Inc. of Orange, Calif. Linographics, which is a high-resolution service bureau and purveyor of fonts and clip art, has been selling downloadable wares over a NovaLink board for three years.

"The program audits the downloads, then we check the data files and process the invoices," he said. "My users don't have much interest in talking to each other, so I don't have a lot of message forums.

"However, every customer I sell [computer systems] to gets a modem and NovaLink client software. If our tech-support people can't figure what's going on over the phone, they can upload the problem file, and one of our technicians can check it out."

Myers said his next project will be selling nondownloadable software, RAM chips, scanners, laser printers and other hardware on-line. To make service-bureau orders easier, he's pressuring ResNova to create a customizable dialog window that works like an invoice.

According to Myers, the company has been highly responsive to his suggestions. "From Day One they have supported externals, or plug-ins," Myers said. "And if a feature that you need is too specialized, they can hook you up with a programmer so that an external can be easily written to cover other needs, such as on-line credit card approval."

**Smaller players.** Several vendors whose products feature lower price tags and fewer features are also increasing the type and scope of communications supported.

TeleFinder Group Edition from Spider Island Software is a GUI-equipped BBS package that's configured to simplify remote dial up and file transfers. A new version, to be released this summer, will include gateways to QuickMail and the Internet — and possibly other E-mail systems or communications protocols as well, according to the vendor.

Second Sight 2.1 from The FreeSoft Company already includes Internet and FidoNet links, and it can import and export E-mail to and from the system. FreeSoft said a multiline version of the product will ship in four to six weeks.

Also following this connection-happy trend is hi-BBS from XBR Communications Inc. XBR markets an X.25 card for its BBS system, which supports both Mac and PC Windows clients with GUI client software and can link with mainframes via TCP/IP.

By the end of the second quarter, XBR said, the product will include

*See E-mail, Page 60*

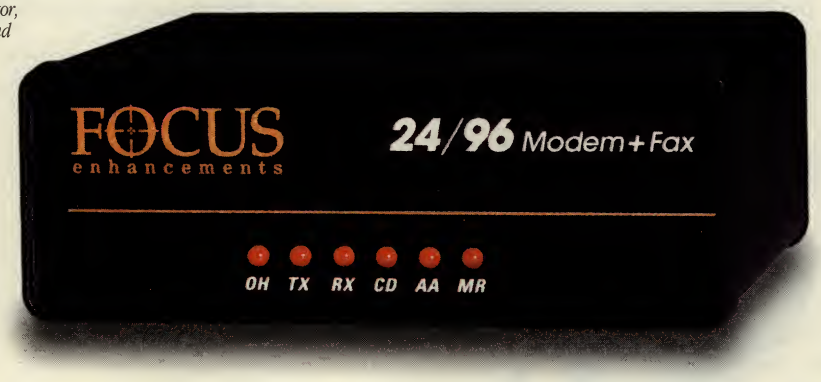
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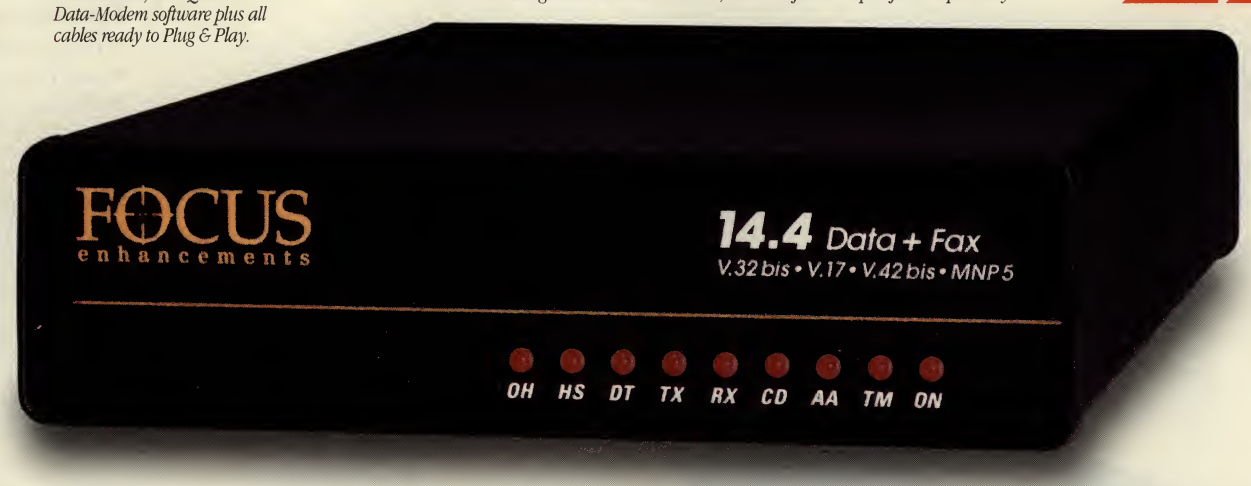

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## E-mail

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built-in QuickMail, FidoNet, Unix to Unix Copy Program, FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol) and Microsoft Mail links.

Because hi-BBS fully supports System 7 and Apple events, network managers can alias the entire BBS system to more than one Mac, avoiding system overloads and allowing separation of functions. For example, one Mac could handle telecommunications transfers while another provided access to a CD-ROM library, yet appeared as a single system to users.

**A future for business BBS products.** BBS software vendors have hardly abandoned the hobbyist with these products. If anything, the increasingly sophisticated needs of the hobbyist market have contributed to the addition of communications links.

But corporate customers have been the driving force behind business-oriented development, especially those customers seeking ways to bypass ARA as a method for communicating with employees at home or in the field.

When the possibilities of automating some levels of customer support and perhaps even increasing corporate revenues through low-overhead on-line sales come into view, the attraction between business sites and these enhanced BBS products will be strong. □

## Product Info

AMERICA ONLINE INC.
**America Online:** $7.95 per month with two free hours each month
8619 Westwood Center Drive, Vienna, Va. 22182
Phone (800) 827-6364

AT&T EASYLINK SERVICES
**Access III:** $100
400 Interspace Parkway, Parsippany, N.J. 07054
Phone (800) 242-6005; fax (201) 818-6534

COMPUSERVE INC.
**CompuServe:** Call for pricing options
5000 Arlington Centre Blvd., Columbus, Ohio 43220
Phone (800) 848-8199

THE FREESOFT COMPANY
**Second Sight 2.1:** $135; **Second Sight 3.0:** Price not available
105 McKinley Road, Beaver Falls, Pa. 15010
Phone (412) 846-2700

GENERAL ELECTRIC INFORMATION SERVICES
**GEnie:** $4.95 per month
401 N. Washington St., Rockville, Md. 20850
Phone (301) 340-4000 or (800) 638-9636

INFORMATION ACCESS TECHNOLOGIES INC.
**HoloNet:** $2 per hour during off-peak times, $4 per hour during peak; $6 per month applies to total monthly usage
46 Shattuck Square, Suite 11, Berkeley, Calif. 94704
Phone (510) 704-0160 or (800) 638-4656

INTERCON SYSTEMS CORP.
**WorldLink Basic Service:** $29 (1,200 to 2,400 bps) or $39 (9,600 bps) per month; **WorldLink E-mail:** $19 (1,200 to 2,400 bps) or $29 (9,600 bps) per month
950 Herndon Parkway, Suite 420, Herndon, Va. 22070
Phone (703) 709-9890 or (800) 638-2968;
fax (703) 709-5555

MCI MAIL
**MCI Mail:** Call for pricing options
1133 19th St. N.W., Suite 700, Washington, D.C. 20036
Phone (914) 934-6480 or (800) 444-6245

RESNOVA SOFTWARE INC.
**NovaLink Professional 3.0:** $300 for base configuration, $299 for unlimited NovaLink users (call for pricing on other user packages); **AppleTalk Option:** $500; **AppleTalk Access:** (cutdown) $100; **X.25 Option:** $1,500; **TCP/IP Professional Package:** $1,000; **TCP/IP Internet Kit:** $300; **QuickMail Gateway:** $500
5011 Argosy, Suite 13, Huntington Beach, Calif. 92649
Phone (714) 379-9000; BBS (714) 379-9004

SOFTARC INC.
**FirstClass:** $395 to $2,595, depending on site size and configuration; **five- to 100-user package:** $199
805 Middlefield Road, Suite 102, Scarborough, Ontario M1V 2T9, Canada
Phone (416) 299-4723

SPIDER ISLAND SOFTWARE
**TeleFinder Group Edition 3.0:** $425, multiline unlimited users
4790 Irvine Blvd., Suite 105-347, Irvine, Calif. 92720
Phone (714) 669-9260; fax (714) 669-1383;
BBS (714) 730-5785

XBR COMMUNICATIONS INC.
**hi-BBS:** $369 (two-line version) to $3,069 (unlimited users)
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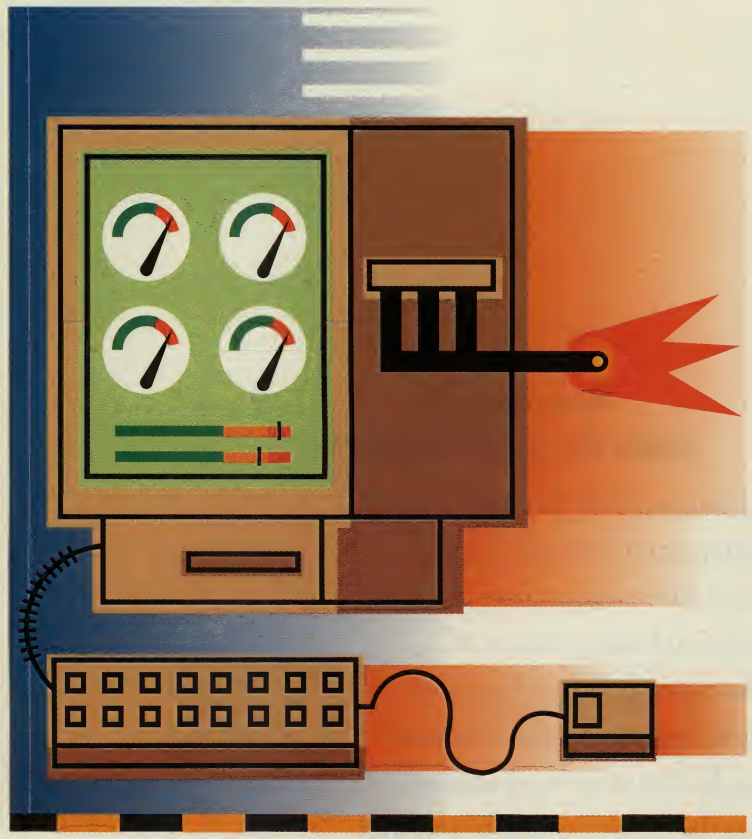
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GORDON STUDER

**MacInTouch** RIC FORD

# Revving up Mac ticker boosts speed, danger

Mac hardware hackers have figured out a performance trick that costs only a few bucks in parts, but an amateur technician risks ruining the logic board.

BUGS & TIPS

**Clock-rodding.** Like the master mechanic who tweaks a racing car for every last sliver of speed, there are a few fearless hackers who enjoy pushing the Macintosh beyond its normal limits.

The following techniques are not for the faint of heart. A mistake in execution could destroy your logic board, and the change will certainly void any Apple warranty. But the trick offers masters of soldering a chance for a substantial boost in horsepower for just a few dollars.

The basic approach is very simple: Replace the Mac's master clock crystal with a faster one. The first reports I heard came via the Internet, and several people had replaced the 40-MHz crystal in the IIsi with a 50-MHz crystal, revving up the processor to the speed of a IIci.

More recently, a Mac developer reported successfully replacing the standard crystals in Quadra 700s and 900s with crystals that push the machines to Quadra 950 speeds.

**Risky business.** Aside from the tricky business of taking a soldering iron to the Mac logic board, there are inherent risks involved in raising its redline. The higher speed takes more power and generates more heat, and the CPU is not guaranteed for reliable operation by Motorola Inc. beyond the speed coded on its label. The chip's life span could be shortened.

Because of production-line variations, one CPU chip might tolerate the extra stress, while another might fail completely, and a third might fail only intermittently. Variations in ambient temperature may affect reliability.

Other factors for the IIsi include the RAM speed (100-nanosecond chips might be too slow for a hot-rodded IIsi) and the presence of an FPU (floating-point unit) or expansion card.

Out of about 20 IIsi machines hot-rodded, one-quarter were reported to have problems. At least one worked better after adding a heat sink to the CPU to keep it cooler. Another failed when a NuBus adapter was in place but worked without it. A third failed with an FPU but worked without it.

The Quadra hackers reported no problems among several souped-up machines.

**Hot swaps.** The best approach is to desolder the original crystal and solder a socket in its place. (Be careful to note the orientation of the crystal, one of whose corners should be different from the other three.)

With a socket, you are free to switch between the original crystal and various faster crystals to determine what works best.

Please don't try the procedure unless you are dead sure of your skills and you are willing to risk the logic board. If you do decide to try it, though, I'd like to hear about the results.

Although there is at least one company, Dynamic Engineering of Ben Lomond, Calif., upgrading crystal speeds in PowerBooks, and Newer Technology of Wichita, Kan., sells a multipart clock upgrade for the IIfx, you shouldn't assume that such swaps are workable in all Mac models. There could be strange side effects, especially in timing-sensitive areas such as floppy drives and networking.

**Mouse detectives.** Readers have been sending in reports about their own sticky mouse experiences, following the March 15 column on the subject.

A few people found that loosening the screws holding the mouse together ameliorated the problem. In other cases, this has made no difference.

Several people reported problems with the new "ergonomic" mice, while other reports mentioned problems with other varieties of mice manufactured in various places. Some of these were fixed under warranty, but some waited until the warranty was over before failing. One person wrote that he bought a Performa 600 CD with a sticky mouse, and the dealer, a consumer-electronics store, refused to replace it.

Liam Breck, the mouse investigator who collected detailed reports and sent them to Apple, is no longer acting as a clearinghouse. He recommends that people experiencing problems contact Apple's Customer Assistance Center directly. In the United States, the center's phone number is (800) 776-2333.

**Confusing technology.** Readers have also been sending electronic mail about MODE32 and Apple's 32-bit System Enabler (see MacWEEK, March 22). The 32-bit System Enabler seems to be creating a great deal of confusion overall. There is only enough space for a couple of items this week, but we'll cover more in upcoming columns.

One reader wrote that the enabler is incompatible with Apple's 8•24 GC software, unless graphics acceleration is disabled.

Two people reported problems using high-density floppies with MODE32, 32-bit addressing and a DayStar accelerator. Turning off either 32-bit mode or the accelerator eliminated the problem. Gerhard Adler wrote that switching to Apple's 32-bit System Enabler solved the problem on his machines. □

*Comments on MacInTouch are welcome at 7 Parmenter Ave., Maynard, Mass. 01754. Phone (508) 897-2621. Address electronic mail to RICFORD on AppleLink or MCI Mail; to 72511,44 on CompuServe; or on the Internet to 72511.44@compuserve.com. Join us on-line in the MacWEEK Forum at location ZMC:MACWEEK on CompuServe or ZiffNet/Mac.*

**Ask David Ramsey**

# Monitor interference help



Several months ago a reader asked how to prevent the interference of adjacent monitors. This interference is caused by the same low-frequency, electromagnetic fields to which the neo-Luddites attribute everything from acne to cancer. My reply was that there was no effective way to eliminate the jitter.

Then I got a press release from NoRad Corp. of Carson, Calif. NoRad's stock in trade is devices to diminish the various nasties emitted by your monitors. The company claims its ELF ProTech can shield a monitor so that it "could withstand a doubling of magnetic-field strength before image distortion or movement became noticeable."

In other words, if you have two adjacent monitors that interfere with each other, equipping one of them with this shield should eliminate the jitter. To my knowledge this is the first commercial solution for the problem. I haven't tried it myself; I don't have any setups that would benefit. But it sounds intriguing and is probably worth a look. You can call NoRad at (310) 605-0808 or (800) 262-3260.

**Apple changes develop disc.** Right after I tell the whole world that a subscription to develop magazine is the cheap way to keep your system software up to date, Apple changes things! Starting in June the develop disc will no longer be the same as the CD that developers get. The most significant change is that it will not include the system software. To get that, you'll have to subscribe to the full developer mailing at $250 a year.

**Q. What's the difference between a composite 16-Mbyte SIMM and a regular one?**

**A.** A "real" 16-Mbyte SIMM is built with eight 16-Mbit chips; composite 16-Mbyte SIMMs use 32 4-Mbit chips.

Composite SIMMs are large and impressive, covered with chips on both sides of the board. They are also heir to subtle timing and impedance problems, such that many Macs may not operate reliably with them. Apple does not certify any composite 16-Mbyte SIMMs for use in any Mac, although I know of several installations that have used them without a problem.

*Please send questions to David Ramsey on CompuServe: 76702,335 or to Ask David Ramsey, c/o MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105.*

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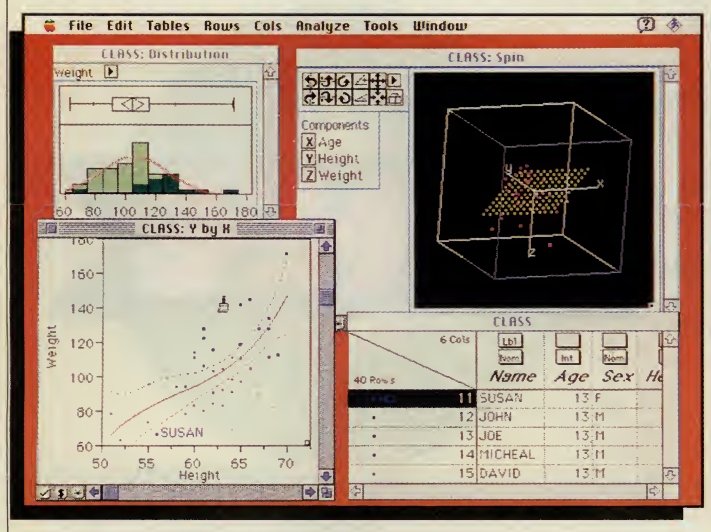
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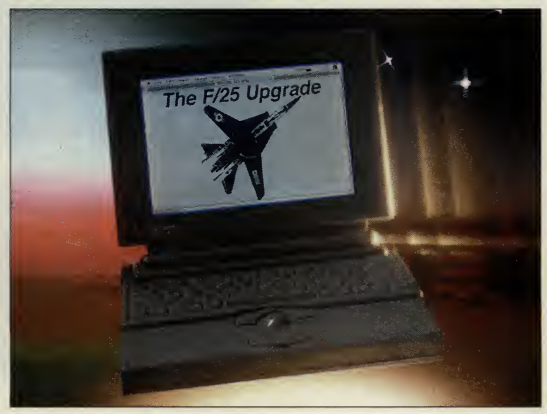
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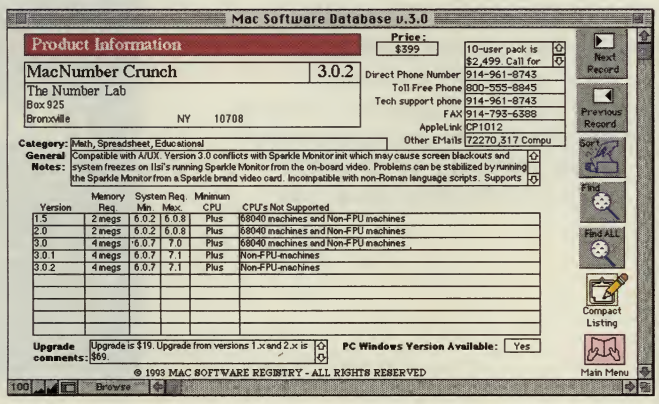
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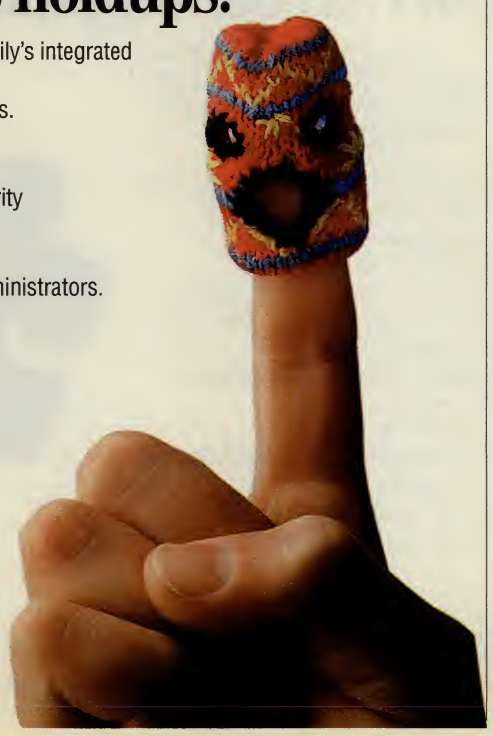
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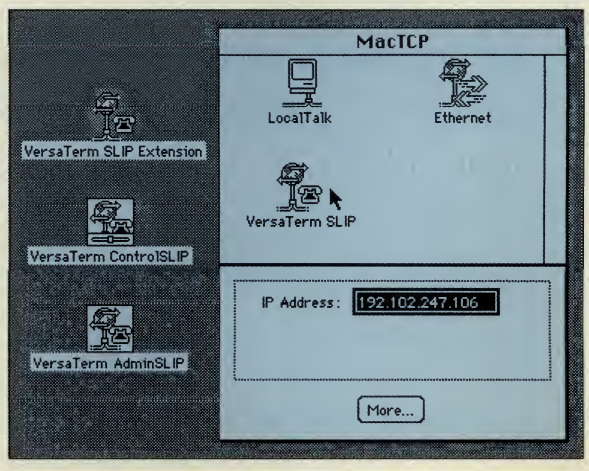
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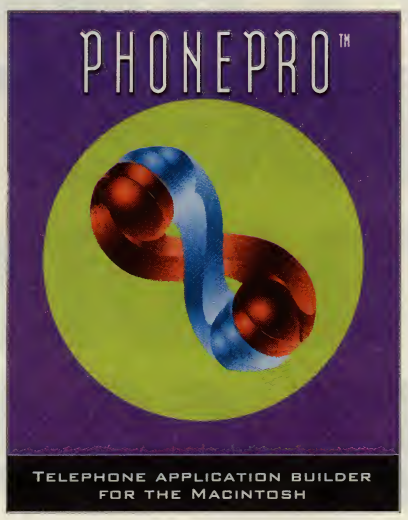
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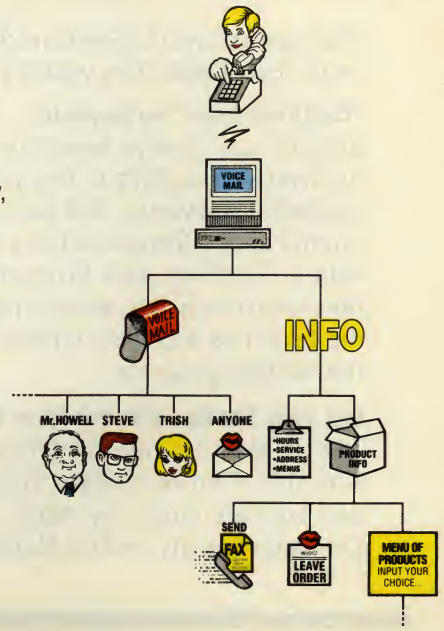
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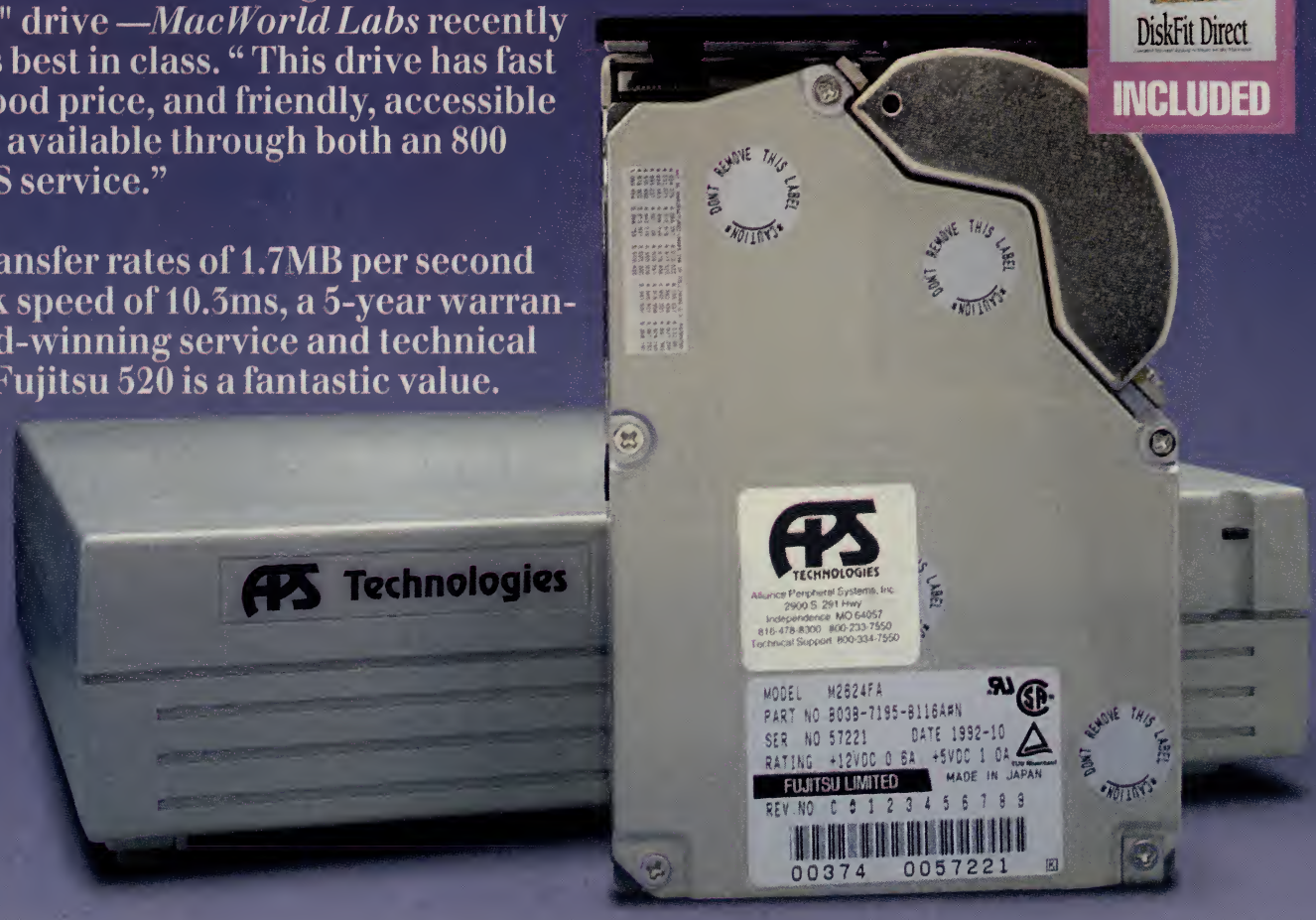
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MW EDITORS' CHOICE

**External Fujitsu 520 $999**




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|---|---|---|
| 240 | $369 | $449 |
| 525 | 939 | 999 |
| 1225[5] | 1499 | 1569 |

[5]5-year warranty

### Quantum MW EDITORS' CHOICE

ELS Low Profile Drives

| MB | INTL | EXTL |
|---|---|---|
| 42 | $159 | $219 |
| 85 | 199 | 269 |
| 127 | 279 | 349 |
| 170 | 299 | 359 |

### Maxtor Mac User LABS ★★★★

| MB | INTL | EXTL |
|---|---|---|
| 120[2] | $229 | $309 |
| 213[2] | 349 | 409 |
| 340[2] | 599 | 669 |
| 540[2] | 1049 | 1149 |
| 1240[3] | 1649 | 1749 |
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|---|---|---|
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| 2.0G | 2699 | 2799 |

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PowerBook Go•Drives

| MB | INTL | EXTL |
|---|---|---|
| 80GRS | $349 | $499† |
| 120 | 399 | 529† |
| 160GRS | 549 | 679† |

†Battery-powered Companion Case for the PowerBook

### Fujitsu MW EDITORS' CHOICE

| MB | INTL | EXTL |
|---|---|---|
| 520 | $899 | $999 |
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| 1.2G | 1399 | 1499 |

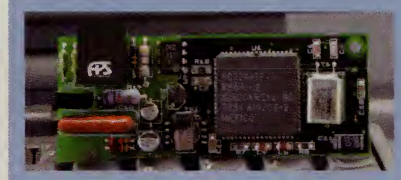


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## SyQuest

MW Editors' Choice

| Model | INTL | EXTL |
|---|---|---|
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| SQ5110 | 469 | 489 |
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*SyQuest Cartridges 44/88.....$65/100*
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MW Editors' Choice

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|---|---|
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*All APS Tape Drives Include Retrospect by Dantz*

## DAT

MacUser Labs ★★★★ MW Editors' Choice

| Model | INTL | EXTL |
|---|---|---|
| APS TurboDAT | $1499 | $1599 |
| APS CompDAT | 1199 | 1299 |
| APS DAT | 1099 | 1199 |

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| Model | INTL | EXTL |
|---|---|---|
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| C 170 MB | 3.5" LPS, 2 yr warr, 150,000 MTBF | $288 | $348 |
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| 520 MB | 3.5" 9ms, Fast SCSI, 5yr warr, 200,000 MTBF | $898 | $978 |
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| 1.2 Gig | 5.25" 11.5ms, 5yr warr, (MacWorlds Fastest Gig!) Fast SCSI | $1298 | $1398 |
| 2.06 Gig | 5.25" 11.5ms, 5yr warr, 300,000 MTBF, Fast SCSI | $2288 | $2388 |
| 2.4 Gig | 5.25" 11.5ms, 5yr warr, 300,000 MTBF, Fast SCSI | $2448 | $2548 |

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|---|---|---|---|
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| 240MB (3½") | $369 | $429 | $479 | $529 |
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| 80MB (2½") for Powerbook | $299 | See PocketDrive | | |
| 120MB (2½") for Powerbook | $389 | See PocketDrive | | |
| 160MB (2½") for Powerbook | $499 | See PocketDrive | | |

| Seagate | Internal | ZFP+ |
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Hailed as one the most powerful and useful hard disk management software available, Silverlining offers unique features found no where else!

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## Cirrus Optical

Includes one free cartridge ($79 value).

| | Internal | External |
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| 128MB 3½" Optical | $1399 | $1499 |
| Drive with Retrospect | $1499 | $1599 |
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Includes Retrospect™ and 1 free tape.

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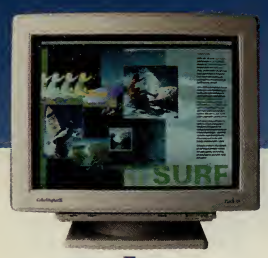
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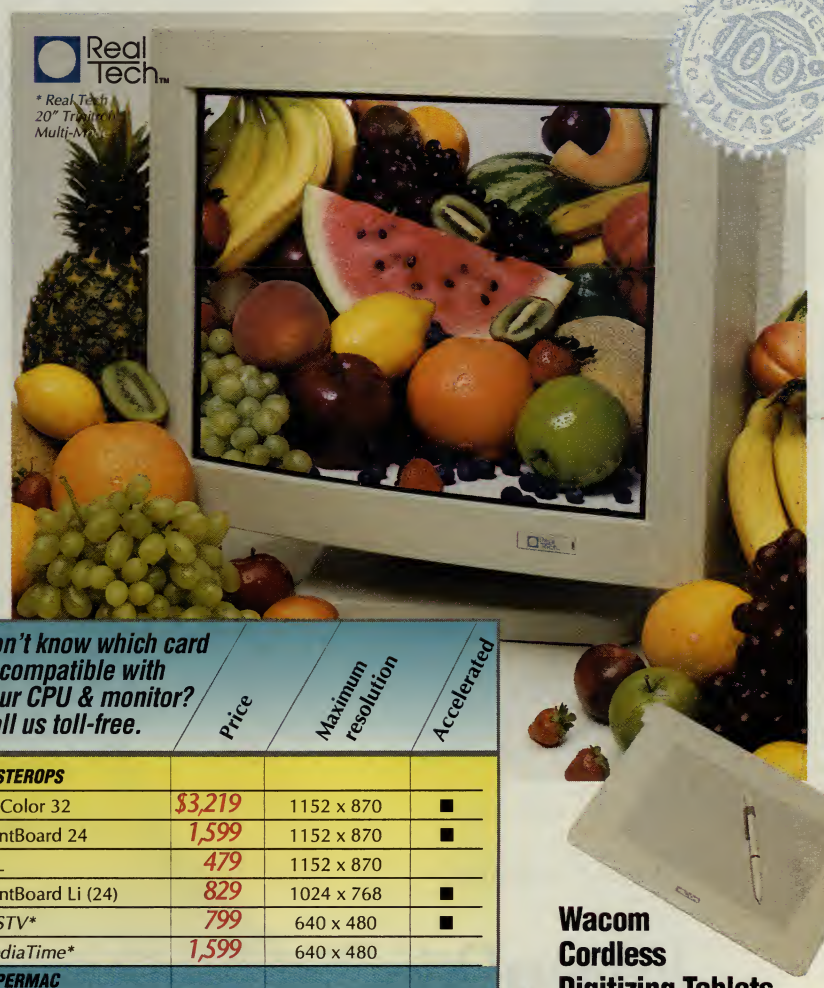

* E-Machines 16" Color (ColorPage T16)

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* SuperMac 20" (SuperMatch Dual-Mode)

SUPERMAC



Real Tech

* Real Tech 20" Trinitron Multi-Mode

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| Need help choosing a monitor? Not sure if you need one that auto-syncs? Call our friendly sales team. They're happy to answer your questions. | Price | Tube type | 640 x 480 | 640 x 870 | 832 x 624 | 1024 x 768 | 1152 x 870 | Auto-syncing | Anti-glare |
|---|---|---|---|---|---|---|---|---|---|
| A. Radius 21" Color | $3,069 | Hitachi | | | | | ■ | | ■ |
| *NEC 21" 6FG Color* | 2,429 | NEC | ■ | | ■ | ■ | ■ | ■ | |
| *SuperMac 21" Mono/Grayscale* | 989 | — | | | | | ■ | | ■ |
| B. SuperMac 20" (SuperMatch) | $1,499 | Hitachi | | | | ■ | | | ■ |
| C. RasterOps 20" Trinitron Multi-Mode | 2,329 | Trinitron | ■ | | ■ | ■ | ■ | ■ | ■ |
| * RealTech 20" Trinitron Multi-Mode | 1,895 | Trinitron | ■ | | ■ | ■ | ■ | ■ | ■ |
| *Radius Precision Color 20"* | 2,389 | Trinitron | ■ | | ■ | ■ | ■ | ■ | ■ |
| *RasterOps 20" Hitachi Color* | 1,469 | Hitachi | ■ | | ■ | ■ | ■ | ■ | ■ |
| * SuperMac 20" (SuperMatch Dual-Mode) | 2,499 | Trinitron | | | | ■ | ■ | | ■ |
| *E-Machines 19" Color (T19 II)* | 2,399 | Trinitron | | | | ■ | ■ | ■ | ■ |
| D. Mitsubishi 17" Diamond Pro | $1,199 | Trinitron | ■ | | ■ | ■ | ■ | ■ | ■ |
| E. NEC 17" 5FG Color | 1,329 | NEC | ■ | | ■ | ■ | ■ | ■ | |
| F. Seiko Instruments 17" CM1760LR | 1,249 | Trinitron | ■ | | ■ | ■ | | ■ | ■ |
| G. Sony 17" | 1,149 | Trinitron | ■ | | ■ | ■ | | ■ | ■ |
| H. RealTech 17" Multi-Mode | 995 | Hitachi | ■ | | ■ | ■ | | ■ | ■ |
| I. RasterOps 16" (RasterOps Sweet 16) | $1,249 | Panasonic | | | ■ | | | | ■ |
| * E-Machines 16" Color (ColorPage T16) | 1,299 | Trinitron | ■ | | ■ | ■ | | ■ | ■ |
| J. NEC 15" 4FG Color | 789 | NEC | ■ | | ■ | ■ | | ■ | |
| K. Radius 15" Precision Color Pivot | $959 | Non-Trinitron | ■ | ■ | ■ | ■ | | ■ | ■ |
| L. Sigma 15" Grayscale (PageView GS) | 579 | Phillips | | ■ | | | | | ■ |
| M. RealTech 15" Grayscale | 449 | — | | ■ | | | | | ■ |
| *Sigma 15" Grayscale (Power Portrait)* | 659 | Phillips | | ■ | | | | | ■ |
| *NEC 15" 3FGX Color* | 669 | NEC | ■ | | ■ | ■ | | ■ | |
| N. Seiko Instruments 14" Color (CM1445) | $499 | Trinitron | ■ | | | | | | ■ |
| O. Sony 13" Color | 689 | Trinitron | ■ | | | | | | ■ |

* shown above

*Your Hardware That Fits partner will tell you which monitors are on-board compatible, and which ones require a card or cable.*

| Don't know which card is compatible with your CPU & monitor? Call us toll-free. | Price | Maximum resolution | Accelerated |
|---|---|---|---|
| **RASTEROPS** | | | |
| ProColor 32 | $3,219 | 1152 x 870 | ■ |
| PaintBoard 24 | 1,599 | 1152 x 870 | ■ |
| 8XL | 479 | 1152 x 870 | |
| PaintBoard Li (24) | 829 | 1024 x 768 | ■ |
| *24STV** | 799 | 640 x 480 | ■ |
| *MediaTime** | 1,599 | 640 x 480 | |
| **SUPERMAC** | | | |
| Spectrum/24 PDQ Plus | $1,549 | 1152 x 870 | ■ |
| Spectrum/8 LCII, IIsi | 499 | 1152 x 870 | |
| Spectrum/8 NuBus | 419 | 1024 x 768 | |
| Spectrum/24 Series IV | 829 | 1024 x 768 | ■ |
| Spectrum/8•24 PDQ | 829 | 640 x 480 | |
| Spectrum/8•24 | 579 | 640 x 480 | |
| *Video Spigot** | 369 | 160 x 120 | |
| *Video Spigot & Sound** | 479 | 160 x 120 | |
| **RADIUS** | | | |
| Precision Color 24X | $1,649 | 1152 x 882 | ■ |
| Precision Color 8XJ | 499 | 1152 x 882 | ■ |
| Precision Color 24XK | 829 | 1024 x 768 | ■ |
| Precision Color 24XP | 499 | 832 x 624 | ■ |
| *Video Vision** | 1,979 | 640 x 480 | |
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| Futura SX24 | 499 | 1024 x 768 | ■ |
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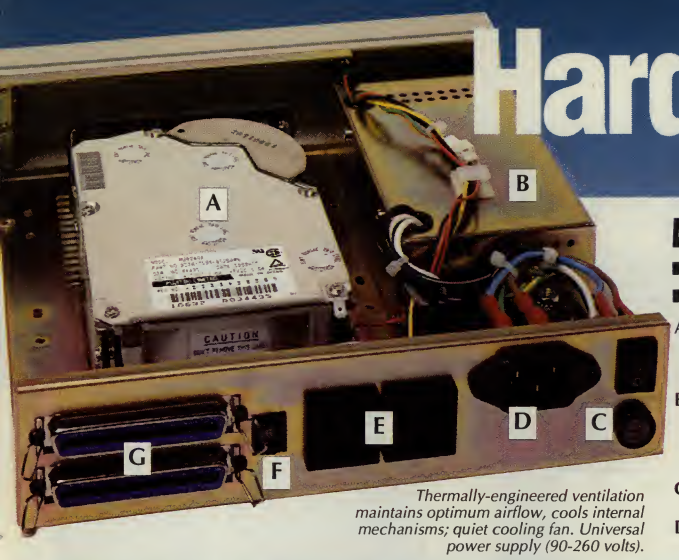
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# Hard drives.




*Thermally-engineered ventilation maintains optimum airflow, cools internal mechanisms; quiet cooling fan. Universal power supply (90-260 volts).*

## Why our drives are superior

- *Fast access times*
- *top-level warranties*
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**A.** *We use the highest quality name-brand mechanisms available; fully tested and burned in*

**B.** *Shielded 40 watt power supply (65 watt for FH drives) keeps the drive free of interference, your data free of corruption*

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**D.** *Power cable plug-in*

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**F.** *Easy-to-use pushbutton SCSI I.D. selector switch*

**G.** *Two 50-pin SCSI connectors for simple configuration*

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|---|---|---|---|---|---|---|---|---|---|
| **40 - 120 Mb** | | | | | | | | | |
| Quantum 42 ELS | ELS42 | $189 | $259 | 40 Mb | 19 ms | 1.4 | 250,000 | 3.5 LP | 2 |
| Conner 85 | CP-30080E | 225 | 295 | 82 Mb | 17 ms | 1.5 | 150,000 | 3.5 LP | 1 |
| Quantum 85 ELS | ELS85 | 219 | 289 | 82 Mb | 17 ms | 1.4 | 250,000 | 3.5 LP | 2 |
| Conner 120 | CP-30100 | 279 | 349 | 116 Mb | 17 ms | 1.5 | 150,000 | 3.5 LP | 1 |
| Maxtor 120 | 7120XT | 269 | 339 | 121 Mb | 15 ms | 1.5 | 150,000 | 3.5 LP | 2 |
| **120 - 250 Mb** | | | | | | | | | |
| Quantum 127 | ELS127 | $289 | $359 | 124 Mb | 17 ms | 1.4 | 250,000 | 3.5 LP | 2 |
| Conner 170 | CP-30170E | 299 | 369 | 160 Mb | 9 ms | 1.5 | 150,000 | 3.5 LP | 1 |
| Quantum 170 ELS | ELS170 | 319 | 389 | 160 Mb | 17 ms | 1.4 | 250,000 | 3.5 LP | 2 |
| Conner 212 | CP-30200 | 379 | 449 | 206 Mb | 12 ms | 2.5[1] | 150,000 | 3.5 LP | 1 |
| Maxtor 213 | 7213 | 379 | 449 | 207 Mb | 15 ms | 2.8 | 150,000 | 3.5 LP | 2 |
| Quantum 240 | LPS240 | 419 | 489 | 234 Mb | 10 ms | 1.4 | 250,000 | 3.5 LP | 2 |
| Maxtor 245 | 7245 | 429 | 499 | 246 Mb | 15 ms | 3.0 | 150,000 | 3.5 LP | 2 |
| Seagate 248 | ST3283N | 519 | 589 | 235 Mb | 12 ms | 3.0[2] | 250,000 | 3.5 LP | 1 |
| **320 - 570 Mb** | | | | | | | | | |
| Maxtor 340 | LXT-340 | $649 | $719 | 324 Mb | 15 ms | 2.1[1] | 150,000 | 3.5 HH | 2 |
| Fujitsu 425 | M2623FA | 899 | 969 | 405 Mb | 9 ms | 2.7[1] | 200,000 | 3.5 HH | 5 |
| Seagate 426 | ST1480N | 919 | 989 | 426 Mb | 14 ms | 2.6[1] | 150,000 | 3.5 HH | 1 |
| Fujitsu 520 | M2624FA | 939 | 1009 | 496 Mb | 9 ms | 2.7[1] | 200,000 | 3.5 HH | 5 |
| Quantum 525 LPS | LPS525 | 989 | 1059 | 500 Mb | 10 ms | 3.2[1] | 250,000 | 3.5 LP | 2 |
| Seagate 525 | ST1581N | 1029 | 1099 | 525 Mb | 14 ms | 4.0[2] | 150,000 | 3.5 HH | 1 |
| Maxtor 540 | MXT-540 | 999 | 1069 | 546 Mb | 9 ms | 5.5[1] | 300,000 | 3.5 HH | 2 |
| Conner 540 | CP-3540 | 979 | 1049 | 515 Mb | 12 ms | 5.5[2] | 150,000 | 3.5 HH | 1 |
| Micropolis 560 | M2105 | 1129 | 1199 | 560 Mb | 10 ms | 5.0[1] | 300,000 | 3.5 HH | 5 |
| **660 Mb - 1.05 Gb** | | | | | | | | | |
| Seagate 663 | ST4766N | $1119 | $1219 | 645 Mb | 15.5 ms | 1.8 | 150,000 | 5.25 FH | 1 |
| Seagate 676 | ST4767N | 1519 | 1619 | 645 Mb | 11.9 ms | 3.0[1] | 150,000 | 5.25 FH | 1 |
| HP 677 | 97556 | 1469 | 1569 | 620 Mb | 13.5 ms | 2.8[1] | 150,000 | 5.25 FH | 5 |
| Quantum 700 | PRO700 | 1249 | 1319 | 700 Mb | 10 ms | 2.9[1] | 350,000 | 3.5 HH | 2 |
| Toshiba 877 | MK-438FB | 1099 | 1169 | 830 Mb | 12.5 ms | 3.0[1] | 200,000 | 3.5 HH | 2 |
| Quantum 1050 | PRO1050 | 1419 | 1489 | 1000 Mb | 10 ms | 2.9[1] | 350,000 | 3.5 HH | 2 |
| HP 1050 | 97558 | 2099 | 2199 | 987 Mb | 13.5 ms | 2.8[1] | 150,000 | 5.25 FH | 5 |
| Seagate 1050 | ST11200N | 1649 | 1719 | 1000 Mb | 10.5 ms | 5.1[2] | 200,000 | 3.5 HH | 1 |
| **1.1 - 3.6 Gb** | | | | | | | | | |
| Fujitsu 1.2 | M2266 | $1395 | $1495 | 1079 Mb | 14.5 ms | 3.0[1] | 200,000 | 5.25 FH | 5 |
| HP 1.2 | C2247 | 1589 | 1659 | 1000 Mb | 10.5 ms | 5.3[1] | 300,000 | 3.5 HH | 5 |
| Micropolis 1.2 | M2112 | 1729 | 1799 | 1005 Mb | 10 ms | 5.0[1] | 300,000 | 3.5 HH | 5 |
| Quantum 1.2 | PRO1225 | 1599 | 1669 | 1200 Mb | 10 ms | 2.9[1] | 350,000 | 3.5 HH | 2 |
| Seagate 1.2 | ST41200N | 1369 | 1469 | 999 Mb | 15 ms | 3.0[1] | 150,000 | 5.25 FH | 1 |
| Toshiba 1.2 | MK-538FB | 1399 | 1469 | 1200 Mb | 12.5 ms | 4.0[1] | 200,000 | 3.5 HH | 3 |
| Maxtor 1.24 | MXT-1240 | 1999 | 2069 | 1240 Mb | 9 ms | 4.5[1] | 300,000 | 3.5 HH | 3 |
| Conner 1.3 | CP-31370 | 2099 | 2169 | 1030 Mb | 10.5 ms | 6.0[1] | 250,000 | 3.5 HH | 1 |
| Micropolis 1.5 | M1528 | 2299 | 2399 | 1341 Mb | 14.5 ms | 2.9[1] | 150,000 | 5.25 FH | 5 |
| Micropolis 1.6 | M1548 | 2379 | 2479 | 1748 Mb | 14 ms | 4.8[1] | 150,000 | 5.25 FH | 5 |
| Seagate 1.6 | ST41651N | 1899 | 1999 | 1352 Mb | 15 ms | 4.0[2] | 150,000 | 5.25 FH | 1 |
| Fujitsu 2.0 | M2652 | 2449 | 2549 | 1752 Mb | 11 ms | 4.8[2] | 200,000 | 5.25 FH | 5 |
| Micropolis 2.0 | M1924 | 2649 | 2749 | 2100 Mb | 11.5 ms | 4.8[2] | 250,000 | 5.25 FH | 5 |
| Seagate 2.1 | ST42100N | 1999 | 2099 | 1900 Mb | 12.9 ms | 3.9[2] | 150,000 | 5.25 FH | 5 |
| Seagate 2.4 | ST42400N | 2879 | 2979 | 2050 Mb | 11 ms | 4.5[2] | 150,000 | 5.25 FH | 5 |
| HP 2.4 | C3010 | 2899 | 2999 | 2000 Mb | 11.5 ms | 5.3[2] | 300,000 | 5.25 FH | 5 |
| Seagate 3.4 | ST43400N | 3999 | 4099 | 2750 Mb | 11 ms | 6.0[2] | 200,000 | 5.25 FH | 5 |
| Micropolis 3.6 | M1936 | 4299 | 4399 | 3022 Mb | 12 ms | 6.0[2] | 250,000 | 5.25 FH | 5 |

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. **MTBF=Mean Time Between Failure *LP=Low Profile HH=Half Height FH=Full Height*

[1] SCSI-2 [2] SCSI-2 Fast ***These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.***



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*Drive w/Diskette 5-pack* ..... *399*

*REALTECH MAGNETO-OPTICAL*

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*Drive w/Diskette 5-pack* ..... *1229*

**Maxoptix Tahiti IIm Drive** (652/1.0 Gb capacity; 35 ms access time; 1 yr. warranty) ..... *$3269*



*REALTECH TAPE BACKUP*

Includes Retrospect 2.0 backup software.
**TEAC 155 Mb Drive** *$499*
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*REALTECH DAT*

**DDS-DC Drive** (2-5 Gb capacity; 1 yr. warranty; includes Retrospect 2.0 backup software)... *$1399*

*The RealTech DAT Drive uses industry-standard DDS-DC compression on a 90-meter tape. Depending on your data, storage capacities may vary from 4 to 8 Gb.*

*SYQUEST®*

**44 Mb Drive** ..... *$389*
**88c Mb Drive** ..... *599*

***Includes one disk or tape**

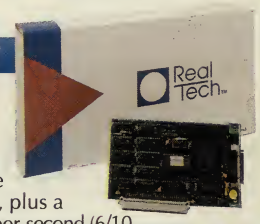
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*5-pack of Floptical Diskettes* ..... *105*
*128 Mb Optical Diskette* ..... *$49*
*5-pack of Optical Diskettes* ..... *209*
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*1.0 Gb ZCAV M-O Cartridge* ..... *239*
*155 Mb TEAC Tape* ..... *$19*
*600 Mb TEAC Tape* ..... *28*
*60-meter DAT Tape* ..... *$13*
*90-meter DAT Tape* ..... *16*
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*Included with your drive,* for efficient operation. Disk partitioning; password protection; diagnostic testing; multiple SCSI-bus support; extensive on-line help; and more. Also included with your drive, System 7.01.

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Allows all Macs to communicate with newer, high-performance hard drives at substantially faster transfer rates. Sustained transfer rate of up to 4.4 Mb per second, plus a burst transfer rate of 6 Mb per second (6/10 on a Quadra). Mirroring capabilities. ..... *$299*

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*To a lot of you, we've become a trusted business partner. So when you told us we needed to offer you more storage options, we listened.*

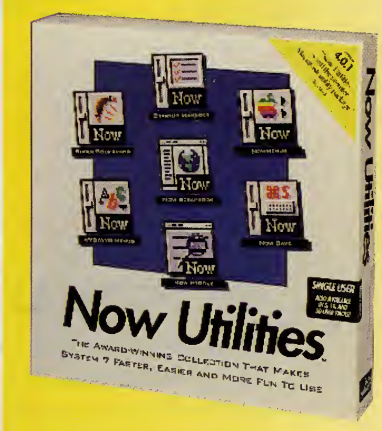
***Our systems engineers have worked tirelessly to design the best possible enclosure for name-brand mechanisms.***

***The result? These drives are the value you've been looking for—priced right, and built with the quality your irreplaceable data demands.***

*During the past eight years, we've become America's one-stop source for Macintosh solutions. Now we can be your one-stop source for storage solutions, too. Because we're the company you can trust to give you the very best...*

- **QUALITY**
- **SERVICE**
- **VALUE**

*Stack up our drives against the "best of the best" and they'll come out on top. You can trust us to always bring you the highest-quality Mac hardware!*




## *Limited time offer!*

***Included FREE with your drive...award-winning Now Utilities (Version 4.0.1).***

Includes 7 powerful utilities: Startup Manager, Super Boomerang, WYSIWYG Menus, Now Profile, and much more. Use Now Utilities to maximize System 7's capabilities, and to simplify using your Mac.

# 1-800-364-WEEK

# WE'VE PUT A
# ON THE
# OPTICAL TE




## THE DEC DSP-3105 1-GIG DRIVE

Introducing the DEC DSP-3105 1-gigabyte drive. This Eddy award-winning monster moves like Ricochet Rabbit on double espresso. It's the world's fastest 3.5 inch drive. Thanks, in part, to a 5400 RPM spindle speed and a whopping 512K drive cache. With our minimum-footprint Cyclone™ enclosure, and a great price, and 5-year warranty, no one can touch it for value. Says MacUser: "It's a dream drive."

| | |
|---|---|
| **Cyclone enclosure** | **$1799** |
| **Classic-style footprint enclosure** | **$1749** |
| **Internal** | **$1699** |

## SPIN CYCLONE 3.5 OPTICAL DRIVE

We've accomplished two firsts. The first is that this is our first optical drive. The second first, even more exciting than the first first (maybe we should have put the second first first), is that this is the first second-generation optical drive for under a thousand bucks. It uses ISO standard 128 MB 3.5 cartridges, so you can use them with other drives. And it comes with our premium Cyclone small-footprint, "brick" enclosure. Plus a two year warranty. So, you ask, "Should I try it first?" In a second.

**Cyclone 3.5 Optical Drive** **$999**
Extra Cartridges: $35

## SPIN DOUBLE SPEED CD ROM DRIVE

If you guessed that by spinning a CD at twice the speed, the Toshiba XM 3401 drive mechanism inside this Spin CD ROM drive can access data twice as fast, that expensive college education isn't going to waste. In fact, it breaks the 200 msec access time barrier. And offers sustained transfer rates of 330 KB/sec. Other CD ROM drives are left with their jaws hanging wide open. This drive is your best choice if you're running Quicktime® movies, photo CD, or multi-media apps. Pretty smart.

**Spin Double Speed CD ROM Drive** (External only) **$499**




## CYCLONE DAT DRIVES

If you're looking for DAT, you'll love dis. Cyclone DAT drives. They feature the zephyr-like Wang DAT drive mechanism – the industry standard for reliability. Our own Cyclone small-footprint chassis. And a price that won't dis you. Our standard Cyclone DAT drive has a 2.0 GB capacity. The compression model, up to 5 gigs. Both come with Dantz™ Retrospect back-up software, and a 90-meter DAT tape, free. Dat's all you need.

| | |
|---|---|
| **Cyclone Standard DAT** | **$1199** |
| **Cyclone Compression DAT** | **$1349** |

# ORDER DIRECT. CALL:

# A NEW SPIN
# LATEST
# ECHNOLOGY.




## SYQUEST 5110C 88/44 DRIVE

You want to upgrade your removable drive to 88 megs, but you've got a shelf full of old 44s staring you in the face. You have two options. One, use the old cartridges as coasters at geek cocktail parties. Or two, buy the new Spin Syquest 5110C drive that reads and writes both 44 and 88 meg cartridges. True, this drive does not format 44 MB cartridges, but we have a way around that – pre-formatted 44s.

| | |
|---|---|
| Syquest 5110C 44/88 Drive | $589 |
| Syquest 88 MB Removable | $489 |
| Syquest 44 MB Removable | $389 |
| **Syquest Media** | |
| Unformatted 44 MB | $61 |
| Unformatted 88 MB | $99 |
| Formatted 44 MB | $85 |
| Formatted 88 MB | $139 |







## ZERO FOOTPRINT DRIVES

We've gotten letters lately – mostly in crayon – from a few folks asking why we call these drives "zero footprint" when they obviously exist in three dimensions and take up space. We'd like to point out that when placed under your Plus or Classic or SE it takes up no more space than the computer already does. Zero. Neat trick, huh? Our sturdy zero-footprint drives feature a number of different mechanisms from makers like Conner, Quantum, Toshiba. Check the matrix below for the capacity you need. And please, put down that crayon.

| Capacity (MB) | Model Number | Average Access Time (msec) | Transfer rate (K/sec) | MTBF (Hours) | MFG warranty (months) | Internal Drive Price | External Drive Price | Cyclone Drive Price |
|---|---|---|---|---|---|---|---|---|
| **Conner** | | | | | | | | |
| 85 | CP-30080E | 16 | 1300 | 150000 | 24 | $199 | $269 | |
| 120 | CP-30100 | 16 | 1300 | 150000 | 24 | $269 | $339 | |
| 170 | CP-30170E | 16 | 1400 | 150000 | 24 | $279 | $359 | |
| 213 | CP-30200 | 15 | 2000 | 150000 | 24 | $349 | $419 | |
| **Quantum** | | | | | | | | |
| 85 | ELS 85S | 17 | 1800 | 250000 | 24 | $199 | $269 | |
| 127 | ELS 127S | 17 | 1800 | 250000 | 24 | $269 | $339 | |
| 170 | ELS 170S | 17 | 2000 | 250000 | 24 | $299 | $369 | |
| 240 | LPS 240S | 16 | 2300 | 250000 | 24 | $399 | $469 | |
| 80 (Pwrbk) | GRS•80 | 17 | 1900 | 150000 | 12 | $349 | | |
| **Toshiba** | | | | | | | | |
| 210 MB (Pwrbk) | MK-2224 | 12 | 1800 | 150000 | 12 | $549 | | |
| 1.2 GB | MK-538 | 12 | 2800 | 250000 | 36 | $1149 | $1199 | $1249 |
| **DEC** | | | | | | | | |
| 1.05GB | DSP-3105 | 9.5 | 2600 | 250000 | 60 | $1699 | $1749 | $1799 |
| **Seagate** | | | | | | | | |
| 456MB | ST-355ON | 12 | 3500 | 250000 | 36 | $849 | $899 | $949 |
| 1.05GB | ST-112OON | 10.5 | 3200 | 200000 | 60 | $1199 | $1249 | $1299 |
| **Fujitsu** | | | | | | | | |
| 520MB | M2624FA | 9 | 2700 | 200000 | 60 | $899 | $949 | $999 |
| 1.06 GB | M2694FA | 9 | 2800 | 200000 | 60 | $1549 | $1599 | $1649 |

Spin, The Spin tornado and Cyclone are trademarks of Spin Peripherals, Inc. All other trademarks are the property of their respective holders.

## 30 DAYS TO DECIDE.

**If you're not satisfied, neither are we (we're referring, of course, to Macintosh peripherals only). That's why every Spin product comes with a 30-day money back guarantee. Test-drive any Spin product. Give it a real workout. If you're not happy, return it within 30 days for a refund. Was that good for you?**

## MORE THAN JUST A LOW PRICE.

**Flip through these pages (not right now, it's just a figure of speech), and you'll see a lot of low prices. The difference with Spin is that you get more. And not just a little more. We include many free things that others charge you for. Like a double-shielded SCSI cable. External terminator. A power supply designed for constant use. Not to mention our own Spin Disk Utilities with free upgrades for a year, system software, and unlimited tech support as long as you own a Spin drive. We aim to please. Call one of the other guys and ask what they'll give you for free. The cardboard box? The owner's manual? Then call us back.**

Spin™
PERIPHERALS

381 Elliot Street, Newton, MA 02164-1162
**Phone: 1-617-965-9882 Fax: 1-617-965-6257**

# 1-800-466-1200

VISA MasterCard

MWK45

1-800-258-2622 CLUBMAC

# Quantum




| Unformatted Capacity | Model | Access Time | Actual MAC Capacity | Internal | External |
|---|---|---|---|---|---|
| **GO•DRIVE (2.5" HARD DRIVES DESIGNED FOR POWERBOOKS)** | | | | | |
| 80mb | GO80 | 17ms | 80mb | $299 | $399 |
| 120mb | GO120 | 17ms | 120mb | $389 | $489 |
| **ELS SERIES (3.5" LOW PROFILE AND LOW POWER)** | | | | | |
| HURRY! WHILE SUPPLIES LAST 42mb | ELS42 | 19ms | 40mb | $175 | $235 |
| 85mb | ELS85 | 17ms | 82mb | $199 | $259 |
| 127mb | ELS127 | 17ms | 124mb | $255 | $315 |
| 170mb | ELS170 | 17ms | 160mb | $279 | $339 |
| **LPS SERIES (3.5" LOW PROFILE)** | | | | | |
| HURRY! WHILE SUPPLIES LAST 105mb | LPS105 | 11ms | 100mb | $229 | $289 |
| NEW 120mb | LPS120 | 10ms | 116mb | $215 | $275 |
| 240mb | LPS240 | 10ms | 234mb | $369 | $429 |
| 525mb | LPS525 | 10ms | 500mb | $899 | $959 |
| **PRODRIVE SERIES (3.5" HALF HEIGHT)** | | | | | |
| HURRY! WHILE SUPPLIES LAST 425mb | PRO425 | 9ms | 406mb | $850 | $910 |
| 700mb | PRO700 | 10ms | 670mb | $1195 | $1255 |
| 1.0GIG | PRO1050 | 10ms | 1001mb | $1329 | $1389 |
| 1.2GIG | PRO1225 | 10ms | 1165mb | $1479 | $1539 |

GO•Drives carry a ONE Year Warranty. ELS drives, LPS drives, PRO drives carry a TWO Year Warranty.




## CLUBMAC 88C REMOVABLES*

| | |
|---|---|
| ClubMac 88c External (SQ5110C) | $579 |
| ClubMac 88c Internal | $559 |
| ClubMac 88c Dual | $1045 |

* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.

## CLUBMAC 44MB REMOVABLES

| | |
|---|---|
| ClubMac 44mb External (SQ555) | $385 |
| ClubMac 44mb Internal | $345 |
| ClubMac 44mb Dual | $695 |

## CLUBMAC 88MB REMOVABLES

| | |
|---|---|
| ClubMac 88mb External (SQ5110) | $489 |
| ClubMac 88mb Internal | $469 |
| ClubMac 88mb Dual | $875 |

## SYQUEST CARTRIDGES

| | |
|---|---|
| 44mb Cartridge | $63 |
| 88mb Cartridge | $97 |

FEATURING SyQuest® REMOVABLE TECHNOLOGY



SyQuest Drives include TWO Year Warranty, one cartridge and necessary cables, SCSI Director™ Formatting Utility. SyQuest Cartridges carry a ONE Year Warranty.



# Seagate

## FEATURING...THE ELITE DRIVES

| Unformatted Capacity | Model | Description | Access Time | Actual MAC Capacity | Internal | External |
|---|---|---|---|---|---|---|
| **3.5" DISK DRIVES** | | | | | | |
| 248mb | ST3283N | Low Profile | 12ms | 235mb | $479 | $539 |
| 1.2GIG | ST11200N | Half Height | 10.5ms | 1000mb | $1329 | $1389 |
| **WREN AND ELITE SERIES (5.25" FULL HEIGHT)** | | | | | | |
| 645mb | ST4767N | Wren Runner II | 11.9ms | 634mb | $1519 | $1619 |
| 1.2GIG | ST41200N | Wren-7 | 15ms | 989mb | $1199 | $1299 |
| 1.6GIG | ST41651N | Wren-8 | 15ms | 1350mb | $1679 | $1779 |
| 2.1GIG | ST42100N | Wren-9 | 12.9ms | 1900mb | $1869 | $1969 |
| 1.6GIG | ST41600N | Elite-1 | 11.5ms | 1307mb | $1839 | $1939 |
| 2.4GIG | ST42400N | Elite-2 | 11ms | 2050mb | $2539 | $2639 |
| 3.4GIG | ST43400N | Elite-3 | 11ms | 2750mb | $3419 | $3519 |

Seagate drives carry a ONE Year Warranty.

# Maxtor

## *6300 RPM



| Unformatted Capacity | Model | Access Time | Actual MAC Capacity | Internal | External |
|---|---|---|---|---|---|
| **XT SERIES (3.5" LOW PROFILE)** | | | | | |
| 120mb | 7120S | 15ms | 121mb | $225 | $285 |
| 207mb | 7213S | 15ms | 202mb | $329 | $389 |
| **LXT & MXT SERIES (3.5" HALF HEIGHT)** | | | | | |
| 330mb | LXT-340 | 15ms | 324mb | $579 | $639 |
| FAST!! 535mb* | MXT-535 | 8.5ms | 521mb | $949 | $1009 |
| FAST!! 1240mb* | MXT-1240 | 8.5ms | 1150mb | $1499 | $1559 |
| **PANTHER SERIES (5.25" FULL HEIGHT)** | | | | | |
| 1.2GIG | PO-12S | 13ms | 997mb | $1295 | $1395 |
| 1.7GIG | P1-17S | 13ms | 1433mb | $1595 | $1695 |

Maxtor drives carry a TWO Year Warranty.

# FUJITSU




| Unformatted Capacity | Model | Access Time | Actual MAC Capacity | Internal | External |
|---|---|---|---|---|---|
| **3.5" HALF HEIGHT** | | | | | |
| 425mb | M2623FA | 9ms | 405mb | $839 | $899 |
| 520mb | M2624FA | 9ms | 496mb | $889 | $949 |
| 1.1GIG | M2694 | 8.5ms | 995mb | $1549 | $1609 |
| **5.25" FULL HEIGHT** | | | | | |
| 1.2GIG | M2266 | 14.5ms | 1029mb | $1289 | $1389 |
| 2.0GIG | M2652 | 14.5ms | 1665mb | $2249 | $2549 |
| 2.4GIG | M2654 | 11.5ms | 2000mb | $2499 | $2599 |

# TOSHIBA

| Unformatted Capacity | Model | Description | Access Time | Actual MAC Capacity | Internal | External |
|---|---|---|---|---|---|---|
| NEW! 213mb | MK2224FB | 2.5" Low Profile | 12ms | 207mb | $559 | $659 |
| 1230mb | MK538FB | 3.5" Half Height | 12ms | 1185mb | $1395 | $1455 |

Toshiba drive carries a ONE Year Warranty.

# ClubMac TAPE BACKUP Systems




### TAPE BACKUP MEDIA

| | |
|---|---|
| 60 METER DAT | $13 |
| 90 METER DAT | $16 |
| CT600N | $19 |
| CT600F | $28 |

NOW SHIPPING WITH RETROSPECT V2.0 BACKUP SOFTWARE

| Capacity | Model | Description | Media | Internal | External |
|---|---|---|---|---|---|
| 155mb | Teac MT2ST/N50 | Analog | CT600N | $429 | $449 |
| 600mb | Teac MT2ST/F50 | Analog | CT600F | $629 | $649 |
| 2.0GIG | Archive Python | DAT, DDS | 4mm | $1129 | $1149 |
| 3-5GIG | Archive Turbo DAT | DAT, DDS-DC | 4mm | $1339 | $1359 |
| 2.0GIG | Hewlett Packard 35470A | DAT, DDS | 4mm | $1329 | $1349 |
| 3-5GIG | Hewlett Packard 35480A | DAT, DDS-DC | 4mm | $1529 | $1549 |

Includes RetroSpect v.2.0 Backup Software, One Tape and ONE Year Warranty

# ClubMac OPTICAL Drives

SHARP INTERNAL OPTICAL IS PERFECT FOR THE MAC IIVX, CENTRIS 650 & Q 900/950

| Model | | Capacity | Description | Seek | Internal | External |
|---|---|---|---|---|---|---|
| CMO-OD3000 | Teac | 128mb | 3.5" Half Height | 45ms | $949 | $989 |
| CMO-3100E | Ricoh | 128mb | 3.5" Half Height | 45ms | $1035 | $1075 |
| NEW! CMO-JY750 | Sharp | 594/652mb | 5.25" Half Height | 40ms | $2255 | $2295 |
| CMO-5031E | Ricoh | 594/652mb | 5.25" Full Height | 28ms | | $2345 |
| CMO-Tahiti II | MaxOptix | 650mb/1.0GIG | 5.25" Full Height | 35ms | | $3195 |
| 128mb Cartridge | | 3.5" Single Sided | | | | $39 |
| 594/652mb Cartridge | | 5.25"-512/1024 bytes/sec | | | | $99 |

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

# CONNER

| Unformatted Capacity | Model | Description | Access Time | Actual MAC Capacity | Internal | External |
|---|---|---|---|---|---|---|
| 85mb | CP30080E | 3.5" Low Profile | 17ms | 82mb | $199 | $259 |
| 170mb | CP30170E | 3.5" Low Profile | 17ms | 160mb | $279 | $339 |
| 212mb | CP30200 | 3.5" Low Profile | 12ms | 206mb | $369 | $429 |
| 540mb | CP30540 | 3.5"Half Height | 10ms | 515mb | $897 | $957 |

Conner drives carry a ONE Year Warranty.

# ACCELERATORS

## APPLIED ENGINEERING

### MAC II, IIX, IIFX, IICX, IICI, IISI (NUBUS), PERFORMA 600

| | W/O FPU | W/ FPU |
|---|---|---|
| TRANSWARP 040 25MHZ | | $1799 |
| TRANSWARP 040 33MHZ | | $2429 |

### MAC IICI - CACHE IN

| | | |
|---|---|---|
| TRANSWARP CI-50 (030-50MHZ) | $739 | $879 |

### LC, LCII, PERFORMA 400, COLOR CLASSIC

| | | |
|---|---|---|
| TRANSWARP 4325 (030 25MHZ) | $CALL | $CALL |
| TRANSWARP 4333V (030 33MHZ) | $CALL | $CALL |
| TRANSWARP 4340 (03040MHZ) | $CALL | $CALL |

### MAC SE / CLASSIC

| | | |
|---|---|---|
| TRANSWARP 030 16MHZ | $319 | $399 |
| TRANSWARP 030 40MHZ | $599 | $729 |

## DAYSTAR DIGITAL

### POWERCACHE

| | | |
|---|---|---|
| 33 MHZ TURBO 040 | | $1345 |
| FASTCACHE FOR TURBO 040 | | $335 |
| CHARGER FOR PHOTOSHOP | | $759 |

COMPATIBLE WITH CLASSIC, SE, LC, SE/30, II, IIX, IICX, IISI, IICI, PERFORMA

| *POWERCACHE ADAPTER NOT INCLUDED | W/O FPU | W/ FPU |
|---|---|---|
| 33 MHZ POWERCACHE* | $375 | $465 |
| 40 MHZ POWERCACHE* | $545 | $635 |
| 50 MHZ POWERCACHE* | $715 | $845 |
| EQUALIZER LC | $169 | $239 |
| POWERCACHE ADAPTER | $41 | |

### CACHE CARDS

| | |
|---|---|
| FASTCACHE IISI / IISI WITH FPU | $279/ 349 |
| FASTCACHE IICI | $199 |
| FASTCACHE QUADRA - Q700/900 | $249 |
| FASTCACHE QUADRA - Q700/900/950 | $375 |

### EXPANSION BOARDS

| | |
|---|---|
| DUALPORT IISI / POWERMATH LC | $165 /115 |

## RADIUS

| | |
|---|---|
| ROCKET 25I **NEW LOW PRICE!!** | **$1049** |
| ROCKET 33 | $1949 |
| SCSI-2 BOOSTER / ROCKETSHARE | $249/ 399 |

## SUPERMAC

| | |
|---|---|
| THUNDERSTORM | $815 |

CALL FOR MORE SUPERMAC PRODUCTS

## TECHWORKS

### CACHE CARDS

| | |
|---|---|
| MAC IICI 64K | $179 |

### MAC SE

| | W/O FPU | W/ FPU |
|---|---|---|
| 25MHZ 030 ACCELERATOR | $419 | $459 |
| 40MHZ 030 ACCELERATOR | $469 | $549 |

### MAC CLASSIC

| | | |
|---|---|---|
| 25MHZ 030 ACCELERATOR | $429 | $529 |
| 40MHZ 030 ACCELERATOR | $459 | $589 |

### MAC LC & LCII

| | |
|---|---|
| 25MHZ 040 ACCELERATOR | $769 |

### MAC NUBUS

| | |
|---|---|
| 25MHZ 040 ACCELERATOR | $1399 |
| 33MHZ 040 ACCELERATOR | $1699 |
| MAC IISI WITH PASS THRU PDS | $149 $215 |

# FAX MODEMS

## GLOBAL VILLAGE

### POWERPORT (INTERNAL POWERBOOK FAX/MODEMS)

| | | |
|---|---|---|
| BRONZE | (24/96 S/R FAX MODEM) | $179 |
| SILVER | (96/96 S/R FAX MODEM) | $359 |
| GOLD | (14,400 S/R FAX MODEM) | $419 |

### TELEPORT (EXTERNAL DESKTOP FAX/MODEMS)

| | | |
|---|---|---|
| BRONZE | (24/96 S/R FAX MODEM) | $189 |
| SILVER | (96/96 S/R FAX MODEM) | $359 |
| GOLD | (14,400 S/R FAX MODEM) | $419 |

## PSI

| | | |
|---|---|---|
| POWERMODEM I | (24/96/48 S/R FAX MODEM) | $129 |
| POWERMODEM II | (24/96/96 S/R FAX MODEM) | $225 |
| POWERMODEM III | (96/96 S/R FAX MODEM) | $325 |
| POWERMODEM IV | (14.4/14.4 S/R FAX MODEM) | $419 |
| COMSTATION I / COMSTATION V | | $135 / 429 |
| COMSTATION NETWORK | (WITH SW) | $159 |

## PIGEON

| | |
|---|---|
| 14.4 INTERNAL PWRBK FAX MODEM | $299 |

## SUPRA TECHNOLOGY

| | | |
|---|---|---|
| SUPRAFAXMODEM | V.32 WITH SOFTWARE | $289 |
| SUPRAFAXMODEM | V.32 STANDALONE | $239 |
| SUPRAFAXMODEM | V.32 BIS WITH SOFTWARE | $349 |
| SUPRAFAXMODEM | V.32 BIS STANDALONE | $299 |

## US ROBOTICS

| | |
|---|---|
| MAC & FAX 14.4 FAX / DATA MODEM | $249 |

# MEMORY

MEMORY PRICES CHANGE FREQUENTLY, CALL FOR CURRENT PRICES

### STANDARD MAC

| | |
|---|---|
| 1MB / 2MB / 4MB X 8 SIMMS | $32 / 67 / 129 |
| 4MB WITH PAL SIMMS | $139 |
| 8MB SIMMS / 8MB SIMMS FOR Q700 | $289 299 |
| 16MB SIMMS OR 16MB LOW PROFILE | $585 |

### MAC IIFX

| | |
|---|---|
| 1MB X 8 SIMMS / 4MB X 8 SIMMS | $34 / 129 |
| 8MB SIMMS / 16MB SIMMS | $299 / 599 |

### CENTRIS 610/650/LCIII

| | |
|---|---|
| 4MB / 8MB / 16MB | $149 / 299 / 615 |
| 256K VRAM | $22 |

### QUADRA 800

| | |
|---|---|
| 4MB / 8MB / 16MB | $179 / 339 / 685 |

### VIDEO RAM

| | |
|---|---|
| 256K VRAM FOR QUADRAS | $22 |
| 512K VRAM FOR LC, LCII, IIVX | $49 |

### POWERBOOK 140/145/170

| | |
|---|---|
| 6MB MEMORY MODULE | $210 |

### POWERBOOK 160/180

| | |
|---|---|
| 4MB / 6MB MEMORY MODULE | $169 / 245 |
| 8MB / 10 MB MEMORY MODULE | $325 / 419 |

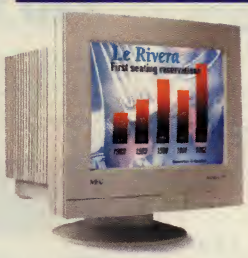
### DUO 210/230

| | |
|---|---|
| 4MB / 8 MB MEMORY MODULE | $229 / 345 |

### NEC SILENTWRITER

| | |
|---|---|
| 2MB MEMORY UPGRADE | $99 |

# MONITORS AND VIDEO CARDS




NEC

CASH $100 REBATE

**GET A $100 REBATE WHEN YOU BUY THE NEC MACFG 24XP COLOR DISPLAY INTERFACE CARD AND A 15" OR 17" MULTISYNC FG COLOR MONITOR.**

### COLOR MONITORS

| | |
|---|---|
| **15" MULTISYNC 3FGX** | **$609** |
| **15" MULTISYNC 4FG (ACCUCOLOR)** | **$729** |
| 17" MULTISYNC 5FG (ACCUCOLOR) | $1299 |
| 21" MULTISYNC 6FG (ACCUCOLOR) | $2349 |

### COLOR DISPLAY INTERFACE CARDS

| | |
|---|---|
| **MACFG 24XP** | **$495** |
| MACFG 24X / 8X | $1199 / 639 |

## RADIUS

### MONITORS

| | |
|---|---|
| COLOR DISPLAY/21 | $2319 |
| **PRECISIONCOLOR PIVOT** | **$935** |
| PRECISIONCOLOR 20 OR 20/S | $2319 |
| PRECISIONCOLOR/19 | $2029 |
| FULL PG DISPLAY / MONO PIVOT | $569 / 699 |
| 2-PG DISPLAY/19 | $879 |
| 2-PG DISPLAY/21 / 21E | $1149 / 1299 |

### VIDEO CARDS

| | |
|---|---|
| PRECISIONCOLOR 8XJ | $489 |
| PRECISIONCOLOR 24X | $1629 |
| PRECISIONCOLOR 24XP / 24XK | $489 / 819 |
| UNIVERSALCOLOR 24 SM / LG | $499 / 839 |
| COLOR PIVOT / MONO PIVOT | $499 / 249 |
| 2-PG / FULL PG DISPLAY | $375/ 189 |
| **POWERVIEW** | **$489** |

## RASTEROPS

### MONITORS

| | |
|---|---|
| 21" COLOR (2168) | $2519 |
| **20 MULTIMODE COLOR (2085H)** | **$1299** |
| 20T MULTISCAN TRINITRON (2075M) | $2139 |
| 21" MONO/GS (2110) | $999 |
| 15" MONO/GS PORTRAIT (1510) | $499 |

### VIDEO CARDS

| | |
|---|---|
| RASTEROPS 24XLI / 24SX | $1889 / 619 |
| **PAINTBOARD 24 / LI** | **$1449 / 815** |

## SUPERMAC

### MONITORS

| | |
|---|---|
| SUPERMATCH 21 TWO-PAGE (9771) | $2449 |
| SUPERMATCH 20•T MULTIMODE | $2449 |
| SUPERMATCH 20 COLOR (9782) | $1479 |
| SUPERMATCH 17•T (9735) | $1049 |
| PLATINUM 21 2-PG DISPLAY (9761) | $989 |

### VIDEO CARDS

| | |
|---|---|
| SPECTRUM/24 SERIES IV | $815 |
| SPECTRUM/24 PDQ PLUS | $1515 |
| **SPECTRUM/8•24 PDQ NUBUS OR IISI** | **$815** |

# MULTIMEDIA AND CD-ROMS

**KODAK'S MULTISESSION PHOTO CD COMPLIANT**



NEC

**MULTISPIN CDR-74**

- 280ms access times
- SCSI-2 compatible
- 256k cache
- MultiSpin Technology
- TWO Year Warranty

| | |
|---|---|
| NEC MULTISPIN CDR-74 | $619 |
| NEC MULTIMEDIA GALLERY | $799 |
| NEC CD EXPRESS... **FREE CD OFFER!!** | $349 |
| NEC MULTISPIN CDR-38 | $479 |

## RADIUS

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|---|---|
| **VIDEOVISION** (BASIC SYSTEM) | **$1625** |
| **VIDEOVISION** (PRESENTATION) | **$1929** |

(PRESENTATION PACKAGE INCLUDES ADOBE PREMIERE 2.0)

## RASTEROPS

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|---|---|
| RASTEROPS 24XLTV | $2639 |
| MEDIATIME / VIDEOTIME | $1499 / 1135 |
| **RASTEROPS 24STV** | **$729** |
| **PHOTOPRO NUBUS** | **$589** |
| VIDEO EXPANDER NTSC | $529 |

## SUPERMAC

| | |
|---|---|
| VIDEOSPIGOT NUBUS* / IISI* | $369 / 329 |
| SPIGOT & SOUND NUBUS* | $479 |
| VIDEOSPIGOT PRO NUBUS**/IISI** | $1069/1229 |
| SPIGOT & SOUND PRO NUBUS** | $1069 |

* FREE ADOBE PREMIERE 2.0 LE ** FREE ADOBE PREMIERE 2.0 FULL VERSION

## TOSHIBA

| | |
|---|---|
| TOSHIBA CD ROM | $719 |

# MISCELLANEOUS

| | |
|---|---|
| **CLUBMAC PHONENET CONNECTOR** | **$14** |
| CLUBMAC EXTENDED KEYBOARD | $79 |
| EXT. HALF HT CABINET WITH CABLES | $75 |
| EXT. FULL HT CABINET WITH CABLES | $125 |
| EXT. DUO BAY WITH CABLES | $125 |
| EXT. 2.5" ENCLOSURE WITH CABLES | $99 |
| HARD DRIVE BRACKETS | $19 |
| 25-50 OR 50-50 SCSI CABLE | $10 |
| HDI 30 - 50 PIN CABLE | $35 |
| HDI 30 - DB 25 CABLE | $30 |
| EXTERNAL TERMINATOR | $7.50 |

# NETWORKING

## ASANTE

### MAC SE (68000 PDS)

| | |
|---|---|
| THK/THN/10BT, 32K | $199 |
| THK/10BT, 32K | $149 |

### SCSI PRODUCTS

| | |
|---|---|
| 10BT, INCL SCSI CABLE | $239 |
| SCSI CABLE-HPDI30 & DB25 FOR PWRBK | $45 |

### FRIENDLYNET ADAPTERS

| | |
|---|---|
| THN FRIENDLYNET MEDIA ADAPTER | $79 |
| THK FRIENDLYNET MEDIA ADAPTER | $79 |
| 10BT FRIENDLYNET MEDIA ADAPTER | $79 |

### 10BASET HUBS

| | |
|---|---|
| 10BT HUB W/12 10T, THK&THN PORT | $479 |
| 12-PORT SMART HUB W/SMNP H/W | $899 |

### ETHERTALK TO LOCALTALK

| | |
|---|---|
| ASANTEPRINT, THK/THN | $319 |
| ASANTEPRINT, THK/10BT | $319 |

### MAC II FAMILY, PERFORMA 600 (NUBUS)

| | |
|---|---|
| THK/THN/10BT, 64K | $199 |
| THK/THN, 64K | $149 |
| THK/10T, 64K | $149 |

### MAC IISI & SE/30 (030 PDS)

| | |
|---|---|
| THK/THN/10T, 64K, FPU SOCKET | $199 |
| THK/THN, 64K, FPU SOCKET | $149 |
| THK/THN, 64K, FPU CHIP | $245 |

### LC, LCII & PERFORMA 400 (020, 030 PDS)

| | |
|---|---|
| THN/10BT, FPU SOCKET | $199 |
| 10T, FPU SOCKET | $149 |
| 10BT, FPU CHIP | $245 |

# PRINTERS

## GCC

| | |
|---|---|
| PLP II | $799 |
| BLP ELITE (4 PPM) | $1149 |
| WIDEWRITER 360 | $1429 |
| WRITE MOVE II | $479 |
| WRITE IMPACT (24-PIN) | $499 |



NEC

**$250 REBATE FROM NEC**

| | |
|---|---|
| **SILENTWRITER 95F** | **$1119*** |
| SILENTWRITER 97 | $1499* |
| SILENTWRITER 95FX (BUILT-IN PS FAX) | $1469* |
| SILENTWRITER 97FX (BUILT-IN PS FAX) | $1809* |

* AFTER MANUFACTURER'S $250.00 REBATE

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| | |
|---|---|
| **HP SCANJET IIC COLOR SCANNER** | **$1295** |

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- COLORSYNC COMPLIANT • ENHANCED DESKSCAN II SOFTWARE
- BUNDLED WITH ADOBE PHOTOSHOP LE

| | |
|---|---|
| **HP SCANJET IIP GRAYSCALE SCANNER** | **$695** |

- 300 DPI (800 DPI VIA INTERPOLATION) SINGLE PASS SCANNING
- COLORSYNC COMPLIANT • ENHANCED DESKSCAN II SOFTWARE

### HEWLETT PACKARD SCANNER OPTIONS

| | |
|---|---|
| AUTO DOC FEEDER FOR HP SJ IIC | $499 |
| AUTO DOC FEEDER FOR HP SJIIP | $279 |
| ScanTastic ps (ADOBE PHOTOSHOP PLUG-IN) | $69 |

# SCANNERS

## EPSON

| | |
|---|---|
| **ES-800C COLOR SCANNER** | **$1399** |
| ES-800C (SOFTWARE NOT INCLUDED) | $1119 |
| **ES-600C COLOR SCANNER** | **$1149** |
| ES-600C (SOFTWARE NOT INCLUDED) | $859 |
| AUTOMATIC DOCUMENT FEEDER | $465 |
| TRANSPARENCY UNIT | $765 |
| ScanTastic ps (ADOBE PHOTOSHOP PLUG-IN) | $69 |

## HEWLETT PACKARD

| | |
|---|---|
| **SCANJET IIC COLOR SCANNER** | **$1295** |
| **SCANJET IIP GRAYSCALE SCANNER** | **$695** |
| AUTO DOC FEEDER FOR HP SJIIC | $479 |
| AUTO DOC FEEDER FOR HP SJIIP | $279 |

## MICROTEK

| | |
|---|---|
| SCANMAKER II | $899 |
| SCANMAKER IIXE | $1179 |
| AUTOMATIC DOCUMENT FEEDER | $479 |

## UMAX

| | |
|---|---|
| UC-630 WITH PHOTOSHOP | $1099 |
| UC-840 WITH PHOTOSHOP | $1299 |
| UC-1200S WITH PHOTOSHOP | $2999 |
| TRANS/SLIDE SCANNER OPTION | $709 |
| AUTOMATIC DOCUMENT FEEDER | $489 |


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## Hard Drives

### CONNER

| Unformatted Capacity | Access Time | Internal | External |
|---|---|---|---|
| **3.5" Disk Drives (2 year Warranty)** | | | |
| 42 mb LPS | 17 ms | $168 | $219 |
| 85 mb LPS | 17 ms | $198 | $248 |
| 120 mb LPS | 12 ms | $258 | $308 |
| 170 mb LPS | 12 ms | $279 | $338 |
| 212 mb LPS | 9 ms | $358 | $419 |
| 540 mb | 8.5 ms | $868 | $928 |

### QUANTUM

| | | | |
|---|---|---|---|
| **GO•Drive 2.5" Hard Drive (All Quantums - 2 year Warranty)** | | | |
| 80 mb | 17 ms | $319 | $419 |
| 120 mb | 17 ms | $449 | $549 |
| 160 mb | 17 ms | $499 | $599 |
| **ELS Series (3.5" Low Profile and Low Power Drives)** | | | |
| 42 mb | 19 ms | $175 | $229 |
| 85 mb | 17 ms | $214 | $268 |
| 127 mb | 17 ms | $289 | $339 |
| 170 mb | 17 ms | $309 | $369 |
| **LPS Series (3.5" Low Profile and Low Power Drives)** | | | |
| 240 mb | 10 ms | $429 | $469 |
| 525 mb | 10 ms | $919 | $979 |
| **Prodrive Series (3.5" Half Height Drives)** | | | |
| 700 mb | 10 ms | $1179 | $1239 |
| 1.0 Gig | 10 ms | $1339 | $1399 |
| 1.2 Gig | 10 ms | $1548 | $1579 |

### TOSHIBA

| | | | |
|---|---|---|---|
| **3.5" & 2.5" Disk Drives (2 year Warranty)** | | | |
| 2.5" 213 mb | 12 ms | $648 | $748 |
| 3.5" 830 mb | 12 ms | $1029 | $1089 |
| 3.5" 1.2 Gig | 12 ms | $1368 | $1428 |

### FUJITSU

| | | | |
|---|---|---|---|
| **3.5" & 5.25" Disk Drives (5 year Warranty)** | | | |
| 3.5" 330 mb | 9 ms | $838 | $888 |
| 3.5" 520 mb | 9 ms | $878 | $958 |
| 3.5" 1.1 Gig | 8.5 ms | $1589 | $1609 |
| 5.25" 1.2 Gig | 11.5 ms | $1289 | $1368 |
| 5.25" 2.06 Gig | 11.5 ms | $2119 | $2219 |
| 5.25" 2.4 Gig | 11.5 ms | $2348 | $2448 |

### SEAGATE

| | | | |
|---|---|---|---|
| **3.5" Half Height Drives (1 and 5 year Warranties)** | | | |
| 1.2 Gig | 10.5 ms | $1358 | $1419 |
| **Wren and Elite Series (5.25" Full Height Drives)** | | | |
| Wren 7 1.2 Gig | 15 ms | $1238 | $1339 |
| Wren 8 1.6 Gig | 15 ms | $1668 | $1768 |
| Wren 9 2.1 Gig | 12.5 ms | $1858 | $1959 |
| Elite 1 1.6 Gig | 11.5 ms | $1828 | $1919 |
| Elite 2 2.4 Gig | 11 ms | $2528 | $2628 |
| Elite 3 3.4 Gig | 11 ms | $3419 | $3519 |

## Modems

### PROMETHEUS

| | Price |
|---|---|
| **Ultima Home Office**<br>ext 14.4/14.4SR Fax w/ V.42 bis & voice | $398 |
| **Promodem 144i Internal for Powerbook**<br>14.4/14.4SR Fax w/ V.42 & V.42 bis | $278 |
| **Promodem 144e**<br>ext 14.4/96SR Fax w/ V.42 & V.42 bis | $278 |
| **Promodem 24e** ext 24/96SR Fax w/ V.42 & V.42 bis | $128 |
| **Promodem Mini 2400** 2400 BPS mini, data only | $79 |

### ZOOM TELEPHONICS

| All units come with Microphone LT Software | Price |
|---|---|
| **Faxmodem PBK for Internal Powerbook**<br>96/48 SR Fax w/2400 BPS Modem | $99 |
| **Faxmodem PKT Portable**<br>96/48 SR Fax w/2400 BPS Modem | $109 |
| **Faxmodem FXV**<br>V42 bis/MNP5/2400 BPS, 96/96 SR Fax | $149 |
| **Faxmodem FXV.32**<br>V.32 bis,14.4 data & fax, V.42 bis/MNP5 | $279 |




## Memory

| Model | 60 NS | 70 NS | 80 NS | Model | 60 NS | 70 NS | 80 NS |
|---|---|---|---|---|---|---|---|
| 1x8 | Call | $33 | Call | 2x8 | Call | $63 | Call |
| 4x8 | Call | $133 | Call | 8x8 | Call | Call | $279 |
| 16x8 FX | Call | Call | $549 | 16x8 Q950 | Call | Call | $515 |

We carry most Mac Memory, Please Call for prices!

Memory for LCIII, Centris 610, 650

| 4mb $139 | 8mb $279 | 16mb $599 |
|---|---|---|

## Media

| Model | QTY 1 | 5PK | 10PK | Model | QTY 1 | 5PK | 10PK |
|---|---|---|---|---|---|---|---|
| SyQ44 cart | $69 | $67 | $65 | SyQ 88 cart | $109 | $104 | $99 |
| 128mb OPT | $49 | $44 | $39 | 256mb OPT | $88 | $84 | $79 |
| 60mm DAT | $20 | $16 | $14 | 90mm DAT | $25 | $19 | $17 |

## Scanners

### UMAX

| Model<br>Includes free software | Price |
|---|---|
| UC630 - Color w/free Photoshop | $1078 |
| UC1200s - Color w/free Photoshop | $2948 |
| UC840 - Color w/free Photoshop | $1248 |
| Transparency Unit | $698 |
| Auto Document feeder | $398 |
| UG600 - Greyscale w/free Typereader OCR, OFOTO & Publish It | $848 |

### MICROTEK

| Includes free software | |
|---|---|
| Scanmaker II - Color w/free Photoshop LE | $948 |
| Scanmaker IIXE - Color w/free Photoshop | $1248 |

## Accelerators

### DAYSTAR DIGITAL

| Model | Without FPU | with FPU |
|---|---|---|
| 33 MHZ Powercache | $379 | $475 |
| 40 MHZ Powercache | $549 | $645 |
| 50 MHZ Powercache | $719 | $859 |
| Powercache Adapter | | $40 |
| Equalizer LC | $169 | $239 |
| Fast Cache IIsi | $279 | $349 |
| Fast Cache IIci | | $215 |
| Fast Cache Quadra | | $259 |
| Fast Cache Q 950 | | $399 |
| 33 MHZ Turbo 040 | | $1399 |
| Fast Cache Turbo 33-12 | | $339 |

## Optical & DAT Drives

| Includes one free disc (1 year Warranty) | | |
|---|---|---|
| 128 mb Panasonic Optical | 39 ms | $998 |
| 128 mb Epson Optical | 29 ms | $1078 |
| 256 mb Most Optical | 31 ms | $1698 |

| Unformatted Capacity | With DIO Backup | With Retrospect |
|---|---|---|
| **Includes free 90m Tape & DIO Backup or Retrospect software** | | |
| WangTek 2.1 Gig DAT | $998 | $1098 |
| WangDat 5.0 Gig DAT | $1398 | $1498 |

## SyQuest

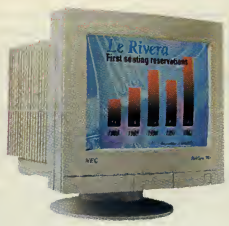
| Unformatted Capacity | Access Time | Price |
|---|---|---|
| **Includes one free cartridge (2 year Warranty)** | | |
| 44 mb External | 19 ms | $378 |
| 88 mb External | 19 ms | $489 |
| 88C mb External | 19 ms | $589 |

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- 65 MHz max. video bandwidth

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MAC CABLE PART # *F1-MACADP*

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MacUser ★★★★½ Best Buy

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- 75 MHz max. video bandwidth

PC MAGAZINE EDITORS' CHOICE — NEC MULTISYNC 4FG MARCH 1993 — World Class Best of '92

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4FG + MacFG™ 8X display interface card $1339
4FG + MacFG™ 24X display interface card $1899

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MacWorld MW — MacUser ★★★★½

- 1280 x 1024 **Non-interlaced** @ 74 Hz
- .28mm Trio dot pitch
- 135 MHz max. video bandwidth

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MAC CABLE PART # *8325FG*

5FG + MacFG™ 24X display interface card $2439

### 6FG™ 21" Monitor — $2299

- 1280 x 1024 **Non-interlaced** @ 74 Hz
- .28mm Trio dot pitch
- 135 MHz max. video bandwidth

*D1-NEC6FG* SRP $2899
MAC CABLE PART # *8325FG*

6FG + MacFG™ 24X display interface card $3479

## SONY

### CPD-1304 14" Multiscan® Trinitron® Color Monitor — $569



- 1024 x 768 **Non-interlaced**
- .25mm Trio dot pitch
- 50MHz bandwidth (typical)

*D1-S1304*

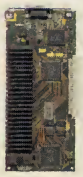
### CPD-1604S 17" Multiscan® Trinitron® Color Monitor — $1049



- 1024 x 768 **Non-interlaced**
- .25mm Trio dot pitch
- 60MHz bandwidth (typical)

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*Than the Epson ES-300C

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|---|---|
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Model 95fx Rebate

| | |
|---|---|
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| NEC MAIL-IN REBATE | - $250 |
| YOUR COST AFTER REBATE | $1399 |

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- 64 KB cache memory
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- AppleTalk®, Rasterport interface
- 39 Adobe® Type 1 scalable fonts
- Up to 10 ppm

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POSTSCRIPT

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*by Federal Express and Airborne.**
*If order is placed by 1p.m. PST.

**NEW!**
*- Syquest 105mb drives -*
***now in stock!***

All Syquest cartridges are bundled with DIVA VideoShop
*– a $599 value –*
**FREE!**
**until 4/30/93**

## Quantum

"An Apple Authorized Brand"

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| ELS 42mb | 19ms | 3.5"TH | $175 | $235 |
| ELS 85mb | 17ms | 3.5"TH | $199 | $259 |
| ELS 127mb | 17ms | 3.5"TH | $259 | $319 |
| ELS 170mb | 17ms | 3.5"TH | $299 | $359 |
| LPS 105mb | 10ms | 3.5"TH | $239 | $299 |
| LPS 120mb | 10ms | 3.5"TH | $279 | $339 |
| LPS 240mb | 10ms | 3.5"TH | $369 | $429 |
| LPS 525mb | 10ms | 3.5"TH | $899 | $959 |
| Pro 700mb | 10ms | 3.5"HH | $1179 | $1239 |
| Pro 1.05gb | 10ms | 3.5"HH | $1339 | $1399 |
| Pro 1.22gb | 10ms | 3.5"HH | $1499 | $1559 |
| *GO•80mb | 16ms | 2.5"PB | $299 | $399 |
| *GO•120mb | 16ms | 2.5"PB | $379 | $479 |

TWO year Warranty. *ONE year Warranty on GO drives.
FWB™ HDT Formatting Software Included.

## SyQuest

| Model | |
|---|---|
| External SyQuest 44mb (*One Cartridge Inc.) | $385 |
| Exernal SyQuest 88mb (*One Cartridge Inc.) | $485 |
| External SyQuest 88mb C** (*One Cartridge Inc.) | $585 |
| External SyQuest 105mb (*One Cartridge Inc.) | $785 |
| Internal 44mb SyQuest (for Quadra 900&950) | $345 |
| Internal 88mb SyQuest (for Quadra 900&950) | $465 |
| Internal 88mb C SyQuest (for Quadra 900&950) | $555 |
| External SyQuest Dual 44mb (*One Cartridge Inc.) | $725 |
| External SyQuest Dual 88mb (*One Cartridge Inc.) | $895 |
| External SyQuest Dual 44/88mb (*One 44 & One 88 Cartridge) | $895 |
| External SyQuest Dual 88C mb (*One Cartridge Inc.) | $1075 |
| External SyQuest Dual 44/88C mb (*One 44 & One 88 Cartridge) | $995 |
| SyQuest 44mb Cartridge/10 Pack | $63/$620 |
| SyQuest 88mb Cartridge/5 Pack | $97/$480 |
| SyQuest 105mb Cartridge | $75 |

All SyQuest Drives come with FWB™ HDT Formatting Software. SyQuest carries a TWO year Warranty on Drives and ONE year on Cartridges.
* READS AND WRITES 44 AND 88 CARTRIDGES. Does not format 44 cartridges.

## TOSHIBA

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| 877mb | 12.5ms | 3.5"HH | $1039 | $1099 |
| 1.23gb | 12.5ms | 3.5"HH | $1339 | $1399 |
| 213mb NEW! | 12ms | 2.5"PB | $639 | $699 |
| **CD-ROM** | | | | |
| 600mb NEW! | 200ms | 3.5"HH | $539 | $599 |

*Kodak Photo-CD/Multisession compatible*

Toshiba carries a THREE year Warranty on drives. ONE year Warranty on CD Rom.FWB HDT Formatting Software Included.



## MAGNETO OPTICAL DRIVES

### TEAC

| Model | Speed | Size | External |
|---|---|---|---|
| 128mb | 45ms | 3.5"HH | $979 |
| 128mb cartridges (Tosoh) | | | $39 |

### RICOH

| Model | Speed | Size | External |
|---|---|---|---|
| 128mb | 45ms | 3.5"HH | $1075 |
| 650mb | 28ms | 5.25"FH | $2345 |
| 128mb/650mb Cartridge | | | $39/95 |

### SHARP

| Model | Speed | Size | External |
|---|---|---|---|
| 650mb | 40ms | 3.5"HH | $2295 |
| 650mb Cartridge | | | $95 |

All MO drives come with FWB HDT software, ONE MO cartridge and have a ONE year Warranty.



BEST PRICES ANYWHERE



CHECK US OUT!

## TAPE BACK-UP DRIVES

### ARDAT

| Model | External |
|---|---|
| Viper 250 | $499 |
| Viper 500 | $699 |
| 2.0gb Standard | $1099 |
| 4.0gb - 8.0gb Compression Turbo | $1499 |
| 90m /60m Tape | $19/$16 |

### TEAC

| Model | External |
|---|---|
| 150mb Tape Backup Drive | $449 |
| 600mb Tape Backup Drive | $649 |
| 600mb / 150mb Tape Cassette | $25/$20 |

All tape backup drives come bundled with FREE Retrospect V.2.0, one tape and have a ONE year Warranty.

## STORAGE *SUPER SPECIAL!*

| | | INTERNAL KIT | PRICE |
|---|---|---|---|
| Maxtor | 120mb | 3.5"HH | $229 |
| Conner | 170mb | 3.5"HH | $279 |
| Toshiba | 213mb | 2.5"PB | $639 |
| Quantum | 240mb | 3.5"TH | $369 |
| Fujitsu | 520mb | 3.5"HH | $899 |
| Quantum | 525mb | 3.5"HH | $899 |
| Fujitsu | 778mb | 5.25"FH | $999 |
| Micropolis | 1.05gb | 3.5"HH | $1339 |

NOVELL CERTIFIED

## MICROPOLIS

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| 698mb | 10ms | 3.5"HH | $1239 | $1299 |
| 1.05gb | 10ms | 3.5"HH | $1339 | $1399 |
| 2.1gb | 12ms | 5.25"FH | $2695 | $2795 |

Fast SCSI-2 Drives. FIVE year Warranty.
FWB™ HDT Formatting Software Included.

## CONNER

"An Apple Authorized Brand"

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| 82mb | 17ms | 3.5"TH | $195 | $255 |
| 160mb | 13ms | 3.5"TH | $269 | $329 |
| 206mb | 12ms | 3.5"TH | $359 | $419 |
| 515mb NEW! | 10ms | 3.5"HH | $899 | $959 |

TWO year Warranty.
FWB™ HDT Formatting Software Included.

## FUJITSU

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| 513mb SPECIAL! | 9ms | 3.5"HH | $899 | $959 |
| 672mb SPECIAL! | 16ms | 5.25"FH | $999 | $1099 |
| 1.0gb NEW! | 9ms | 3.5"HH | $1699 | $1759 |
| 1.03gb | 15ms | 5.25"FH | $1299 | $1399 |
| 1.65gb | 15ms | 5.25"FH | $2289 | $2389 |
| 2.05gb | 12ms | 5.25"FH | $2449 | $2549 |

FIVE year Warranty.
FWB™ HDT Formatting Software Included.

## Maxtor

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| 120mb | 15ms | 3.5"TH | $229 | $289 |
| 203mb | 15ms | 3.5"TH | $339 | $399 |
| 325mb | 15ms | 3.5"HH | $589 | $649 |
| 520mb NEW! | 9ms | 3.5"HH | $975 | $1035 |
| 1.15gb NEW! | 9ms | 3.5"HH | $1599 | $1659 |
| 1.0gb | 13ms | 5.25"FH | $1295 | $1395 |
| 1.43gb | 13ms | 5.25"FH | $1595 | $1695 |

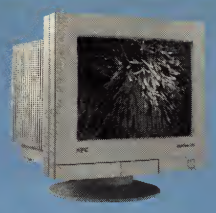
TWO year Warranty on 3.5" Drives and FIVE Years on 5.25" Drives. FWB™ HDT Formatting Software Included.

## Seagate

| Formatted Capacity | Speed | Size | Internal | External |
|---|---|---|---|---|
| 1.0gb | 11ms | 3.5"HH | $1339 | $1399 |
| 1.0gb | 15ms | 5.25"FH | $1249 | $1349 |
| 1.35gb | 15ms | 5.25"FH | $1649 | $1749 |
| 1.9gb | 13ms | 5.25"FH | $1849 | $1949 |
| 1.3gb | 11ms | 5.25"FH | $1799 | $1899 |
| 2.05gb | 11ms | 5.25"FH | $2499 | $2599 |
| 2.75gb | 11ms | 5.25"FH | $3399 | $3499 |

# NEC

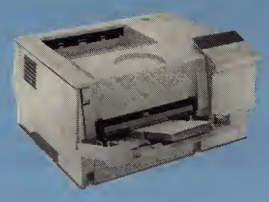
| | |
|---|---|
| MultiSync 3FGx – 15" Monitor | $515* |
| MultiSync 4FG – 15" Monitor | $635* |
| MultiSync 5FG – 17" Monitor | $1205* |
| MultiSync 6FG – 21" Monitor | $2255* |
| FG8x 8-bit board | $645 |
| FG24x 24-bit board | $1205 |
| FG24xp 24-bit board | $505 |
| CD-Express | $355 |
| CD-ROM CDR-74 | $625 |
| Multi-Media Gallery | $805 |
| SilentWriter 95F Printer | $1125** |
| SilentWriter 95FX Printer | $1475** |
| SilentWriter 97F Printer | $1505** |
| SilentWriter 97FX Printer | $1815** |
| ColorMate PS-40 Color Printer | $4399** |



**NEC MultiSync 5FG Monitor**
- 17" Multi-Frequency Color Monitor
- AccuColor Control System
- Up to 1024x768 resolution

MacUser ★★★★★ August 1992

**$1205*** *After $100.00 Mail-In Rebate



**NEC SilentWriter Model 95f Laser Printer**
- PostScript Level 2
- Envelope feeder and cassette included
- 3-year on-site warranty (Limited time offer)

MacUser ★★★★ September1992

**$1125**** **After $250.00 Mail-In Rebate

*– Both offers end 4/30/93 –*

## RasterOps®

| | |
|---|---|
| 21" Mono/Gray-Scale Monitor | $999 |
| 21" Color Hitachi | $2549 |
| 20" Color Trinitron MultiScan | $2099 |
| 20" Color Hitachi MulitScan | $1309 |
| 24 STV Interface | $739 |
| 24 SX Interface | $619 |
| 8 XLI Interface | $929 |
| Paintboard 24 | $1499 |
| Paintboard LI | $829 |
| CorrectPrint 300 | $6599 |

## radius

| | |
|---|---|
| PrecisionColor Display/20 or 20s | $2329 |
| PrecisionColor 19 | $2039 |
| PrecisionColor Pivot | $949 |
| PrecisionColor 24XK Interface | $829 |
| PrecisionColor 24XP Interface | $499 |
| PrecisionColor 8X Interface | $759 |
| VideoVision (Basic) | $1699 |
| VideoVision (Presentation) | $2019 |
| Rockets 25i | $1199 |
| Rockets 33 | $1949 |
| RocketShare | $409 |
| SCSI-2 Booster | $259 |

## SUPERMAC™

| | |
|---|---|
| SuperMatch 21" Color Monitor | $2449 |
| SuperMatch 17" Color Monitor/Multimode | $1149 |
| Two-Page 21" Platinum Monitor | $999 |
| SuperMatch 17T Color Trinitron Monitor | $1049 |
| Thunder/24 | $2349 |
| Spectrum 24 PDQ Plus | $1519 |
| Thunder/8 | $1169 |
| Spectrum/8 • 24 PDQ | $839 |
| Spectrum 24/Series IV **NEW!** | $819 |
| VideoSpigot Nubus | $379 |
| Spigot and Sound Pro | $1159 |
| Digital Film w/Adobe Premiere v2.0 | $4949 |

## SONY.

| | |
|---|---|
| 1302 - 14" Color Multiscan | $599 |
| 1430 - 14" Color Trinitron | $669 |
| 1320LC - 14" Color Trinitron for LC | $429 |
| 1604S - 16" Color Trinitron | $1089 |

***Includes MAC Adaptor. Quadra compatible.**

## SIGMA DESIGNS

| | |
|---|---|
| Power Portrait 15" w/anti-glare | $619 |
| ColorMax 15" | $739 |
| ColorMax 20H - 20" Hitachi | $1639 |
| ColorMax 20T - 20" Trinitron | $2049 |

## HEWLETT PACKARD

| | |
|---|---|
| Deskwriter | $409 |
| Deskwriter 550-C | $769 |
| LaserJet 4M | $1999 |

***Prices include cable.**

## Mac&PC 105 Extended Keyboard only $85

- *Half the price of the Apple Extended Keyboard*
- *Also available in Spanish, French, German & Swiss-German.*
- *One year warranty*

**$85**



## GCC TECHNOLOGIES

| | |
|---|---|
| WriteImpact 24-Pin | $499 |
| PLPII 1mb/4ppm/300dpi | $799 |
| PLPIIS 1mb/8ppm/300dpi | $1099 |
| BLPII 2mb/4ppm/300dpi | $1519 |
| BLPIIS 2mb/8ppm/300dpi | $1769 |
| BLPIIS 4mb/8ppm/300dpi | $2199 |
| BLP Elite 2mb/4ppm/300dpi | $1179 |
| BLP Elite 2mb/8ppm/300dpi | $1429 |
| WideWriter 360 512k/360dpi | $1429 |
| SelectPress 600 8mb/8ppm/600dpi | $3999 |

## UMAX®

| | |
|---|---|
| UC - 1200S with Adobe PhotoShop™ v2.0.1 | $2999 |
| UC - 840 with Adobe PhotoShop™ v2.0.1 | $1299 |
| UC - 630 with Adobe PhotoShop™ v2.0.1 | $1099 |
| Automatic Document Feeder | $489 |
| Transparency / Slide Scanner Option | $709 |

## US Robotics (MODEMS)

| | |
|---|---|
| Mac&Fax SPORTSTER Modem 14.4bps, Send/ Receive FAX Modem **SUPER SPECIAL!** | $299 |
| WorldPort FAX | $459 |

## ASANTÉ

| | |
|---|---|
| MC3NB - Thick/Thin/10 Base T, 64k | $199 |
| MC+IIE64 - Thick/Thin, 64k | $149 |
| MC+IIET64 - Thick/10 Base T, 64k | $149 |
| MC+LCII - Thin/10 Base T, FPU Socket | $199 |

*** We carry the full line of Asante Products.**

## DAYSTAR DIGITAL

| | |
|---|---|
| Turbo 040 25 MHz | $1099 |
| Turbo 040 33 MHz | $1359 |
| Fastcache Turbo 25-128k cache | $259 |
| Fastcache Turbo 33-128k cache | $345 |
| FastCache Quadra (700 & 900) - 128K | $249 |
| FastCache Quadra (700, 900 & 950) - 128K | $379 |
| PowerCache 33MHz OR w/ FPU | $385/$475 |
| PowerCache 40MHz OR w/ FPU | $555/$645 |
| PowerCache 50MHz OR w/ FPU | $725/$855 |
| PowerCache Adapters* | $42 |

*** Additional on all PowerCache cards except for IIci**

## MAC SYSTEMS

| | |
|---|---|
| Powerbook 165 Color | $3249 |
| Classic Color 4/80 **NEW!** | $1399 |
| LC III 4/80 – 4/160 **NEW!** | $1289/$1439 |
| IIVX 4/80 – 4/230 – 5/80 w/CD-Rom | $1639/$1949/$2079 |
| Centris 610 4/80 w/o Ethernet **NEW!** | $1689 |
| Centris 650 4/80 w/o Ethernet **NEW!** | $2449 |
| Quadra 950 8/0 | $4699 |
| Quadra 800 8/230 **NEW!** | $3999 |
| Apple Adjustable Keyboard **NEW!** | $215 |
| Apple 14"/16" Color Monitor | $529/$1279 |
| Color One Scanner **NEW!** | $1299 |
| StyleWriter II **NEW!** | $349 |
| Apple LaserWriter Pro 600/630 | $1999/$2419 |
| Apple Color Printer **NEW!** | $2249 |

## POWERBOOK/DUO ACCESSORIES

***All the extras for upgrading your PowerBook or Duo...***

| | |
|---|---|
| PowerBook Cables (HDI 30-25 or 50) | $35 |
| Radius PowerView for Powerbooks | $499 |
| External Battery Recharger for PowerBook | $149 |
| PowerPad-Sophisticated Circuits | $79 |
| PowerBook Battery | $79 |
| Auto Power Adapter | $89 |
| GCC WriteMove II Printer | $499 |
| AE AxCell (Cellular Phone Interface) | $270 |
| AE DataLink PB | $473 |
| AE Powerbook Auto Adapter | $66 |
| **Duos:** | |
| Duo Floppy Adapter | $135 |
| HDI-20 Ext. 1.44mb Floppy Drive | $199 |
| Duo A/C Adapter | $69 |
| Duo Rechargable Battery | $69 |
| Duo Dock | $1079 |
| Apple Mouse | $79 |
| **Carrying Cases:** | |
| I/O Design Ultimate SL/EX - nylon | $69/$79 |

**Check out our GO Drives in the Quantum Section!**

## MACINTOSH SIMMS

| | |
|---|---|
| 1x8/2x8/4x8/16x8 @ 80ns | $31/$61/$125/$525 |
| **Quadra 700/950** | |
| 4x8/16x8 | $125/$525 |
| **Powerbook 140/170** | |
| 4mb/6mb/8mb | $179/$255/$355 |
| **Powerbook 160/180** | |
| 4mb/6mb/8mb/10mb | $225/$295/$395/$445 |
| **Duo 210/230** | |
| 4mb/8mb | $299/$499 |
| **PC** 1x9/4x9 | $39/$139 |
| ***NEW 32-BIT SIMMS*** | |
| 4x8/8x8/16x8 | $134/$269/$599 |

## TWINCOM (MODEMS)

| | |
|---|---|
| 24/96 PowerTwin – Internal for Powerbooks | $131 |
| 24/96 Commuter – External | $136 |
| 24/96 FaxNet – External | $318 |
| 14.4 Pro– External | $340 |
| 14.4 MacVoyager – Pocket External | $374 |
| 14.4 FaxNet – External | $522 |
| 14.4 PowerTwin – External | $568 |

**Two year warranty.**

## APPLIED ENGINEERING®

| | |
|---|---|
| Plus Drive | $299 |
| 3.5 Mac Drive (External 1.44) | $225 |
| QuadraLink (4 Port Serial for Mac IIs) | $198 |
| TransWarp LC – 25MHz or w/FPU | $360/415 |
| TransWarp LC – 33MHz or w/FPU | $405/507 |
| TransWarp LC – 40MHz or w/FPU | $369/505 |
| TransWarp SE – 25MHz or 40MHz or 40MHz w/FPU | $185/249/390 |
| TransWarp Classic – 25MHz or 40MHz or 40MHz w/FPU | $185/249/390 |

## WACOM (DIGITIZING TABLETS)

| | |
|---|---|
| 6x8 Artz **NEW!** | $309 |
| 6x9 Standard Tablet | $462 |
| 12x12 Standard Tablet | $660 |
| 12x12 ElectroStatic Tablet | $726 |
| 12x18 Standard Tablet | $990 |
| 12x18 ElectroStatic Tablet | $1058 |

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VISA MasterCard AMERICAN EXPRESS DISCOVER NO SURCHARGE!

- Apple/Macintosh products have a ONE year warranty only through Mac&PC USA, Inc. We are not an Apple Authorized Dealer.

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# Ordering From The Corporate Zone

## VIDEO




**NEC 3FGX**
**#07144 ..... $658**

*NEC*

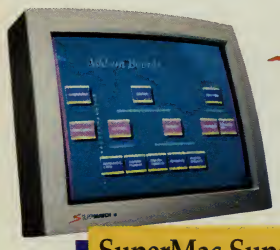
| | | |
|---|---|---|
| 06649 | NEC G 24Xp | $525 |
| 00578 | NEC Mac Clr Displ. Interface Card FG8X | $718 |
| 04985 | NEC Mac Clr Displ. Interface Card FG24X | $1,284 |
| 07143 | NEC Multisync 15" Monitor 4FG | $778 |
| 07399 | NEC Multisync 17" Monitor 5FG | $1,398 |
| 07182 | NEC Multisync 21" Monitor 6FG | $2,698 |




**Radius Precision Color Pivot**
**#06552 ..... $998**

*Radius*

| | | |
|---|---|---|
| 04804 | Precision Clr 24X 325 | $1,788 |
| 05496 | Precision Clr 24XP | $538 |
| 05893 | Precision Clr 8xJ Video Card | $560 |
| 04505 | Radius 21 2 Page Display Monochrome | $1,347 |
| 04507 | Radius TPD II Interface Numbs | $416 |
| 06717 | Video Vision | $2,098 |
| 06716 | Video Vision Stand Alone | $1,779 |
| 04501 | Full Page Display 15 Monochrome | $625 |
| 04901 | Powerview | $539 |



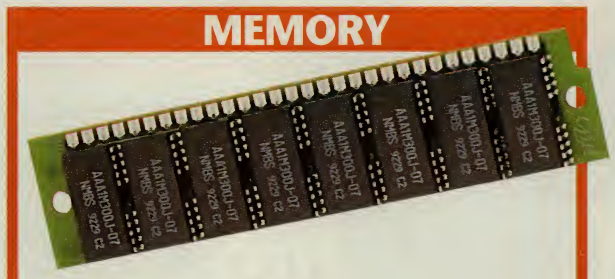
SUPERMAC

**SuperMac SuperMatch 17" Color Monitor**
**#05123 ..... $999**

*SuperMac*

| | | |
|---|---|---|
| 06100 | SuperMatch 17 T Trinitron Color Display | $1,149 |
| 05117 | Spectrum /24 Series IV | $872 |
| 05116 | Spectrum 8 Series III | $438 |
| 05119 | Spectrum 8/24 PDQ | $898 |
| 05118 | Spectrum 8/24 PDQ si | $898 |
| 06315 | Spectrum/24 PDQ Plus | $1,648 |
| 05127 | SuperMatch 20 Clr Display | $1,618 |
| 05125 | SuperMatch 20 Dual-Mode Trinitron | $2,698 |
| 06234 | SuperMatch 20 T Multmode Trinitron Clr D | $2,698 |
| 06476 | SuperView | $499 |
| 05797 | ThunderStorm | $848 |
| 00614 | VideoSpigot IIsi | $338 |
| 05110 | VideoSpigot LC | $254 |
| 00613 | VideoSpigot NuBus | $378 |
| 05111 | VideoSpigot Pro NuBus | $1,098 |
| 05112 | VideoSpigot Pro si | $1,098 |

## MEMORY



NEW PRODUCT

### SIMMs

| SKU | Mac SIMMs SIZE/ | PRICE |
|---|---|---|
| | Seventy Nano-Second for Centris & LCII | |
| 06729 | 72 pin 4MB SIMM 70ns | $148 |
| 06755 | 73 pin 8MB SIMM 70ns | $298 |
| 06808 | 74 pin 16MB SIMM 70ns | $598 |
| | Sixty Nano-Second for Quadra 800 | |
| 06734 | 72 pin 4MB SIMM 60ns | $168 |
| 06756 | 73 pin 8MB SIMM 60ns | $368 |
| 06807 | 74 pin 16MB SIMM 60ns | $688 |

## CABLES

| ITEM# | DESCRIPTION | LENGTH | PRICE |
|---|---|---|---|
| 05761 | DIN 8 M/M | 10' | $11 |
| 05762 | DB 9/DB 25 | 6' | $511 |
| 05763 | DB 9 Male/DIN 8 Female | 1' | $15 |
| 05764 | Mini DIN 8/DB 25 | 6' | $15 |
| 05765 | Mini DIN 8/Mini DIN 8 | 6' | $15 |
| 05766 | Mini DIN 8/Mini DIN 8 | 10' | $11 |
| 05768 | Mini DIN 8/DB 25 | 10' | $15 |
| 05769 | DB 25/Centronics 50 | 2' | $19 |
| 05772 | Centronics 50 M/M | 2' | $19 |
| 05773 | Centronics 50 M/M | 6' | $15 |
| 05574 | Centronics 50 M/F | 6' | $25 |
| 05775 | Centronics 50 M/F Terminator | – | $21 |
| 05776 | 3-pin Mini DIN | 10' | $21 |
| 05777 | 3-pin Mini DIN | 6' | $19 |
| 05778 | DIN 8/2 DIN 3 Connection Box | – | $34 |
| 05779 | 3-pin Mini DIN | 6' | $39 |
| 05839 | PowerBook Drive Adapter HD30 to Centronics 50M | 18" | $46 |
| 05840 | PowerBook Docking Adpater HD30 to DB 25 M/M | 18" | $45 |
| 05841 | PowerBook Drive Adpater HD30 to Centronics 50F | 18" | $47 |
| 05914 | Mini DIN 8/DB 25 (Hardware Handshaking) | 6' | $11 |
| 06317 | 2:1 Mini DIN 8 Switch Box /w Straight Through Cable | 6' | $35 |
| 06318 | 4:1 Mini DIN 8 Switch Box /w Straight Through Cable | 6' | $40 |
| 06327 | DIN 3 Male/RJ11 Phone Plug | 10" | $7 |

## ACCELERATORS




DAYSTAR DIGITAL

**CACHE ADPAPTERS $44**

**Daystar 33MHz turbo 040**
**#06478 ..... $1439**

*DayStar*

| | | |
|---|---|---|
| 06653 | 25 MHZ Turbo 040 For Mac Ci & Si | $1,189 |
| 06482 | Charger | $867 |
| 04182 | Dual Port IISI w/FPU | $182 |
| 00560 | Equalizer LC Virtual Mem Upgr | $182 |
| 00579 | Equalizer LC Virtual Mem Upgr w/FPU | $256 |
| 00561 | Fast Cache 040 QUADRA700/900 | $274 |
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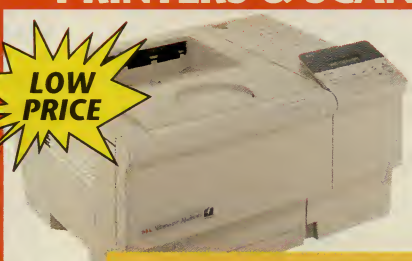
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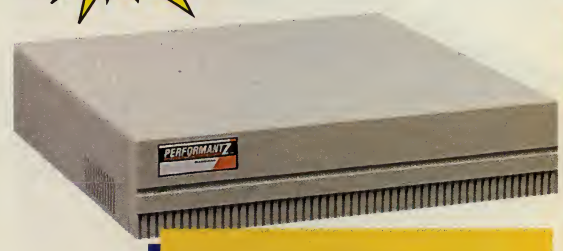
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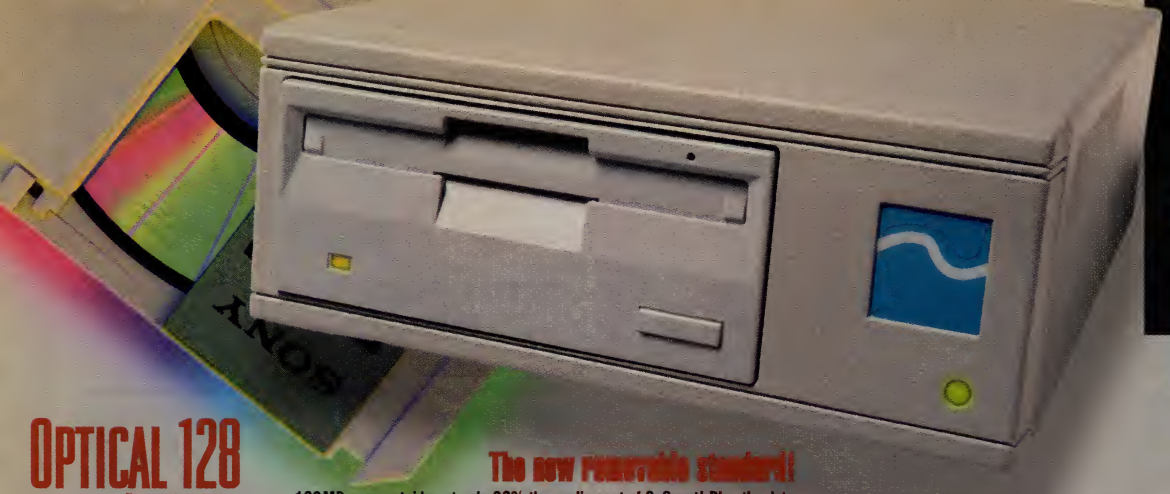
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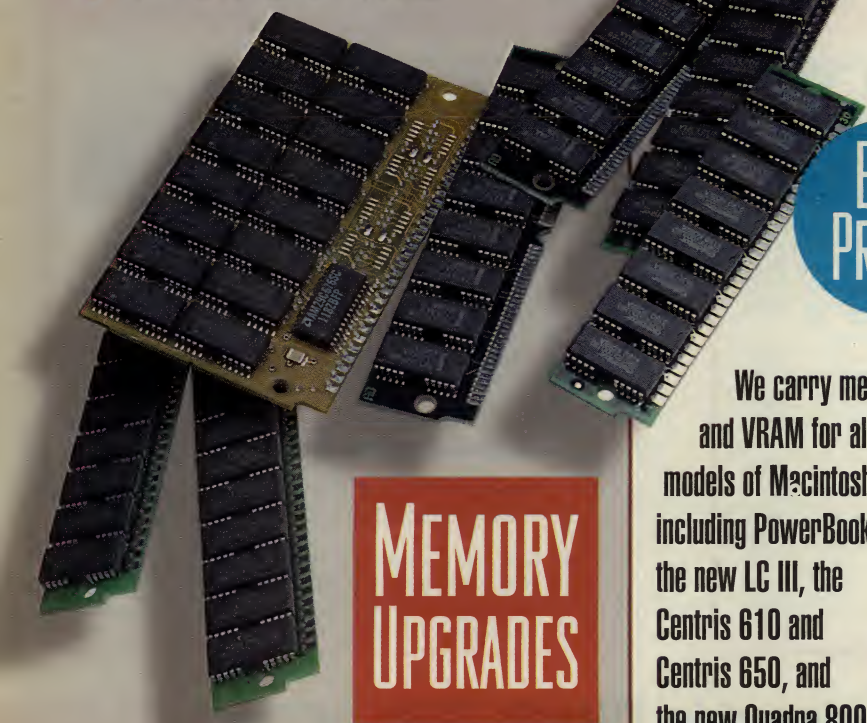
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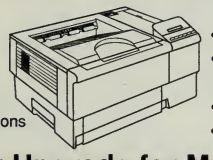
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- 3-year on-site warranty*

**Fax Upgrade for Model 95f** ..... **$489**
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**†after $250 mail-in rebate from NEC**

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**Special Offer**

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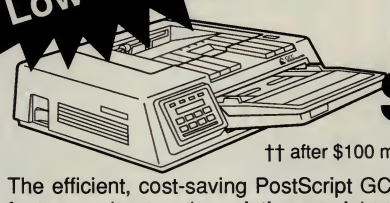
11" x 17" and 8.5" x 11" color output, Built-in AppleTalk, automatic sheet feed, fast print speed, shared or high-volume use.

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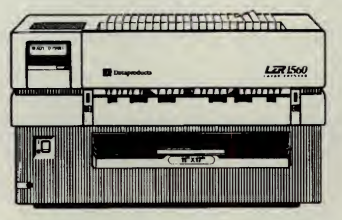
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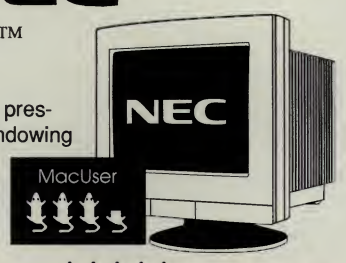
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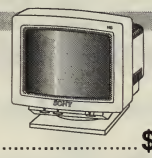
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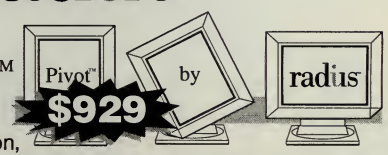
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| Two Page Display interface (NuBus, IIsi, SE/30) | $379 |
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### NEC

SilentWriter Model 95F . 1,495

### Panasonic

Postscript KX-P4455 ..... 1,979



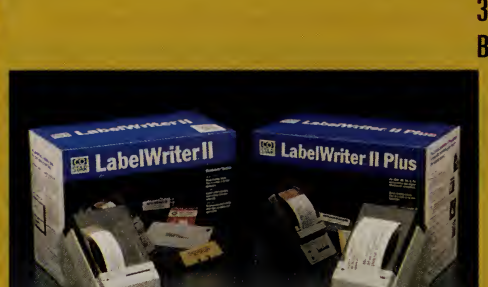
$1495 NEC SilentWriter Model 95F

### Printers Supplies:

NEC Printer 95 Toner ..... 184
Panasonic 4455 Toner ..... 39
TI Printer Toner Kit ..... 42
Lexmark Printer Toner ..... 169

### Hewlett Packard Supplies:

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Toner Cart. 8000pg IIIsi ..... 131.25
Black Microfine Toner Cart. 4,4M .... 115
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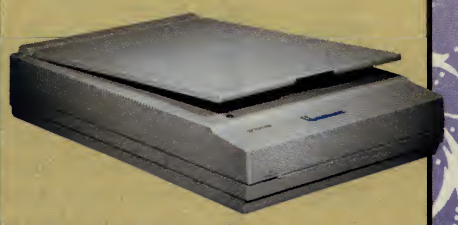

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Video Spigot IIsi ..... 379
Video Spigot LC ..... 399
Video Spigot Pro NuBus ..... 1,369
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DoveFax 144E ..... 299
The Dove Fax 1443 is an external Group III S/R fax modem with fax software and 14.,4 kpbs modem with v.42bis.

### CYPRESS

FaxPro II 9600 Fax Network ..... 629
FaxPro II 14.4 Fax Network ..... 729

### HAYES

Accura 2400 Data ..... 95
Accura 9600 Data/Fax ..... 247
Accura 14.4 Data/Fax ..... 329

### PSI

Power Modem for PB 24/96/48 ..... 188
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Power Modem IV for PB 14.4 ..... 388
COM Station One 24/96/48 ..... 139
COM Station Four 96 ..... 329
COM Station Five 14.4 ..... 388
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| PowerPort Silver 96 | 375 |
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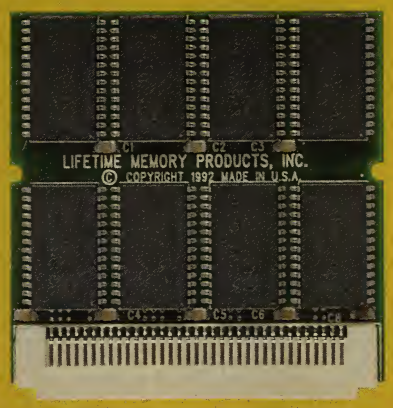
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| 1x8x70 (fx) | 36 |
| 2x8x80 | 61 |
| 2x8x70 | 63 |
| 4x8x80 | 122 |
| 4x8x70 | 124 |
| 4x8x80 (fx) | 124 |
| 4x8x70 (fx) | 126 |
| 4x8x80 (II/IIx) | 135 |
| 4x8x70 (II/IIx) | 137 |
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| 8x8x80 (fx) | 299 |
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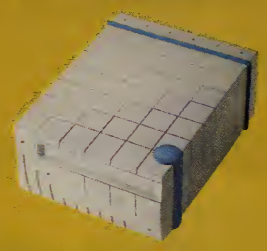
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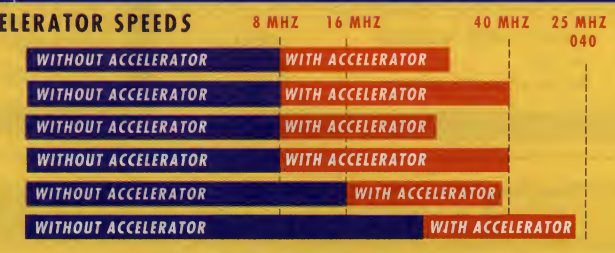
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| Macintosh IIci | • | • | | • | | • | | | • | | | • | • | |
| Mac Classic | • | | • | | | | | | | | | • | | • |
| Classic II, LC, LCII | • | • | | • | | | | | | | | | | |
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| 160/180/165c | | • | | • | • | •[1] | • | | | | | | | |
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[1] 165c does not come in 10MB size

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| 2MX8-80ns..... | $Call |
| 4MX8-80ns..... | $Call |
| 4MX8fx-80ns..... | $Call |
| 4MX8-80ns w/Pal. | $Call |
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| 16MX8-80ns HP... | $Call |
| 16MX8-80ns LP... | $Call |
| 16MX8fx-80ns..... | $Call |
| Classic 1M/3M..... | $Call |
| New 72 Pin: | |
| 4mb..... | $Call |
| 8mb..... | $Call |
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| IIsi 64K Cache Card..... | $125 |
| LC/LCII 16Mhz FPU..... | $49 |
| LC/LCII 20Mhz FPU..... | $59 |
| Classic II 16Mhz FPU... | $49 |
| Classic II 20Mhz FPU... | $59 |
| IIci 64K Cache Card..... | $115 |
| Sonnet Twin Slot LC..... | $235 |

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|---|---|
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| 68882-25Mhz..... | $65 |
| 68882-33Mhz..... | $99 |
| 68882-50Mhz..... | $129 |
| PMMU 68851RC-16Mhz | $69 |

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|---|---|
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| Quadra 700/900/950..... | $384 |
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| FX Overdrive II..... | $250 |

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| Novy Image Pro (Video) - | |
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| Classic 25Mhz w/FPU..... | $639 |

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| SE 40 Mhz w/FPU..... | $521 |
| Classic 25 Mhz W/FPU..... | $500 |
| Classic 40 Mhz w/FPU..... | $550 |
| LC 040, 25 Mhz..... | $725 |
| NuBus 040, 25 Mhz..... | $1325 |
| NuBus 040, 33 Mhz..... | $1450 |

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| | |
|---|---|
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| Radius..... | $Call |
| Xante..... | $Call |

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**IN STOCK NOW!!!**

Powerbook 165C
4MB, 6MB, 8MB
Modules

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| External 88MB..... | $475 |
| Dual Removable 44/44... | $769 |
| Dual Removable 88/44... | $869 |
| External 5110C 88MB.... | $559 |

**CARTRIDGES**

44MB.....$64
88MB.....$95

Drive packages include: Software, Cable, & Cartridges



## PowerBook Alley



**PSEUDO STATIC RAM**

| MODEL | 100 | 140/170 | 160/180 |
|---|---|---|---|
| 2M | $78 | $78 | $85 |
| 4M | $158 | $147 | $158 |
| 6M | $226 | $211 | $245 |
| 8M | — | — | $311 |
| 10M | — | — | $389 |

DUO 210/230

| | | | |
|---|---|---|---|
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Newer Technology Upgradable DUO Modules

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| | |
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| MacSac - Deluxe Carrying Case..... | $59 |

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| PowerBook 100..... | $110 |
| PowerBook 140/145/160/170/180..... | $75 |
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| PowerModem III..... | $329 |
| PowerModem IV..... | $429 |
| CONNECTIX "CPU" Utilities..... | $40 |

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| HDI30 to 25 Pin System..... | $35 |

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LC, IIsi CPU

| | |
|---|---|
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Classic, SE, Plus

| | |
|---|---|
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| w/Standard Keyboard.... | $64 |
| RGB Monitor12", 13"..... | $60 |
| StyleWriter..... | $45 |

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**NOW IN STOCK**

DAYSTAR DIGITAL PRODUCTS

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| NEC Model 95 2mb..... | $89 |
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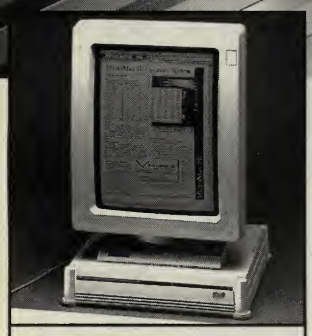
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"The MicroMac MultiSpeed 25MHz . . .deserves mention for offering solid performance at an exceptionally low price."
*MacUser,* April 1993

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Are you one of the three million Mac Plus, SE or SE/30 owners who are frustrated by the slow speed of your Mac and the small 9" monitor? ***Recycle your Mac*** with the MicroMac Upgrade System!

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- ✔ Save desktop space with state-of-the-art slimline enclosure
- ✔ Extend the life of your Mac with new universal power supply and fan
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- ✔ Add fast, internal hard drive to the MicroMac Plus
- ✔ Add color to your Mac SE/30

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**For the Mac SE**
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**For the Mac SE/30**
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MicroMac SE/30 with 8-bit color and 14" Super VGA color monitor .....$999

**Monitors**
15" full page display .....$299

# 25MHz 68030 <$298!

## *Get Mac IIci performance for your SE, Plus or Classic with the MicroMac MultiSpeed 25MHz 68030 accelerator*

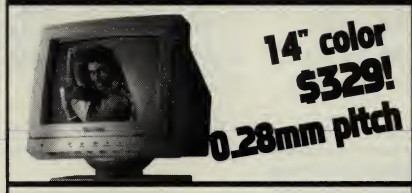
- ✔ Up to 800% performance increase
- ✔ Fully compatible with System 6 and System 7
- ✔ Four SIMM slots for ultra-fast 32-bit memory access
- ✔ Up to 16MB of physical or virtual memory with optional Connectix Virtual 3.0 software
- ✔ 68882 Math co-processor socket
- ✔ Installs in PLUS with optional adapter board

| | |
|---|---|
| 25MHz 68030 MultiSpeed | $298 |
| 32MHz 68030 MultiSpeed | $398 |
| Plus/Classic Adapter Card | $40 |
| 1MB SIMMs 60ns RAM | $37 |
| 1MB SIMMs 45ns RAM | $39 |
| 4MB SIMMs 60ns RAM | $139 |
| Compact Virtual | $80 |
| 25MHz Math Co-Processor | $75 |
| 32MHz Math Co-Processor | $125 |




Increase performance up to 800% by simply connecting the MicroMac MultiSpeed Accelerator to the Classic or Plus' processor with the Adapter Card or by plugging it into the SE's PDS slot.

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.28mm dot pitch, Hitachi tube ....$329
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Displays 16-level greyscale on your IIsi, IIci and LCIII.....$379
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For PLUS, SE, LC, SE/30, II.....$449
**Mac2VGA cable**
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## Hard Drives

**NEC 3856, 19ms, 105MB**.....$229
**Quantum, 3.5" ELS, 10ms, 170MB**.....$299
**Quantum, 3.5" LPS, 10ms, 240MB**.....$429
**Quantum, 3.5" LPS, 10ms, 525MB**.....$899
**Quantum, 3.5" half height ProDrive, 10ms, 1.2GB** .....$1,549
**Fuji, 3.5" half height, 9ms, 525MB**.....$899
**Fuji, 5.25"full height 14.5ms, 1.2GB** .....$1,349

## Acceleration CPU/FPU Upgrades

**Applied Engineering,** TransWarp 4300, 40MHz'030 for Mac LC, LCII & Performa 400.....$499
**LogiCache 50MHz '030**
For Mac SE/30, II, IIsi, IIci, IIvx, IIvi, Performa 600 .....$679
with FPU (68882) .....$779
Adapter for Mac SE/30, II, IIsi, IIcx, .....$69
**Extreme Systems Impact 32MHz '030**
Speeds up your LC, LCII, Performa 400 by 200% to 300% .....$589
with FPU for extremely fast math calculations .....$689
**LC to LCII Upgrade**
Add 68030 and PMMU to get Virtual memory on your LC.....$149
with 68882 math co-processor.....$229
**PMMU for Mac II** (To get Virtual memory for your Mac II) .....$79
**FPU (68882) for Mac II** (overall speed improvement) .....$69
**FPU for LC and LCII, Classic II**
Plugs into PDS slot (16MHz/25MHz).....$64/$89
**68030 with PMMU for Mobius Accelerator** .....$125
**FPU for Performa 600** .....$125

## PowerBook

**Fax/Modem** .....$89
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**Quantum Go Drives**
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**Fuji** 213MB, 12ms .....$699
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## New Mac Memory

| | LCIII Centris 70ns | Quadra 800 60ns |
|---|---|---|
| 2MB | $90 | $100 |
| 4MB | $145 | $155 |
| 8MB | $279 | $299 |
| 16MB | $619 | $749 |
| 32MB | $1,499 | Call! |

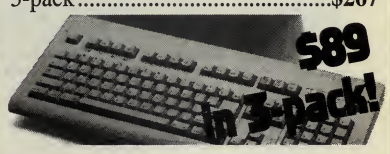
## Upgrade Your PowerBook Memory

| | 2MB | 4MB | 6MB | 8MB | 10MB |
|---|---|---|---|---|---|
| PowerBook 100 | $79 | $189 | $259 | | |
| PowerBook 140/145/170 | $79 | $179 | $239 | | |
| PowerBook 160/180 | $99 | $212 | $279 | $359 | $439 |
| PowerBook 165C | | $249 | $329 | $449 | $599 |
| PowerBook DUO 210/230 | | $209 | | $389 | |

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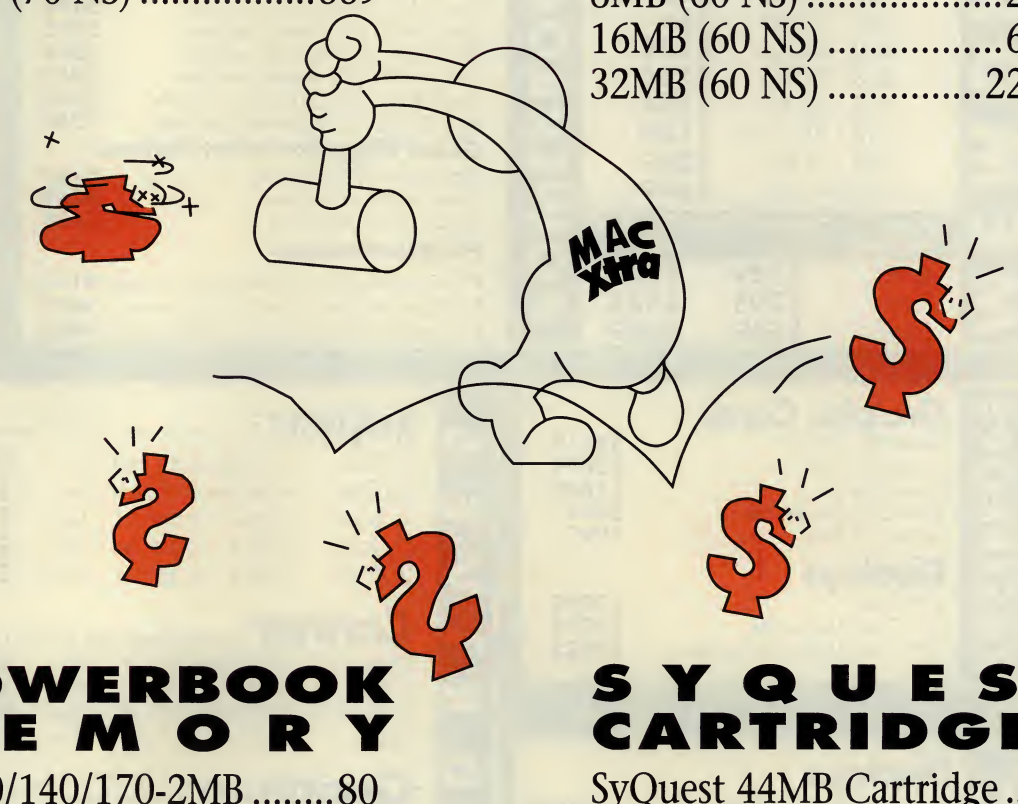
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4x8x70fx .....129
8x8x80fx .....279
16x8x80fx .....529




512K VRAM.....49
256K VRAM.....27
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4x9x70 .....135
TI Microlaser Upgrade.....39
Tool Kit (Simms Inst.Kit)....7
Tool Kit (PowerBook) ....6.50

## 72-PIN SIMMS

4MB (70 NS) .....126
8MB (70 NS) .....259
16MB (70 NS) .....559




## QUADRA 800 60 NS

4MB (60 NS) .....145
8MB (60 NS) .....282
16MB (60 NS) .....679
32MB (60 NS) .....2210

## POWERBOOK MEMORY

PB100/140/170-2MB .....80
PB100/4MB .....189
PB100-6MB.....241
PB140/170-4MB .....169
PB140/170-6MB .....210
PB160/180-4MB .....204
PB160/180-6MB .....290
PB160/180-8MB .....369
PB160/180-10MB .....439
PB165C/4MB.....202
PB165C/6MB.....294
PB165C/8MB.....388
PB165C/10MB.....504
PBDUO 210/230-4MB ....215
PBDUO210/230-6MB .....289
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| 1x8 - 70NS | $35 |
| 2x8 - 70NS | $64 |
| 4x8 - 80NS | $129 |
| 4x8 - 70NS | $134 |
| 4x8 - 80 FX | $134 |
| 4x8 - 80 II/IIx | $139 |
| 8x8 - 80NS | $299 |
| 16x8 - 80 | $499 |

| 72PIN MODULE | Centris/LC III | Quadra 800 |
|---|---|---|
| 4MEG | $129 | $145 |
| 8MEG | $295 | $335 |
| 16MEG | $569 | $699 |

### POWERBOOK

| | |
|---|---|
| 2mg 140/170 memory module | $109 |
| 4mg 140/170 memory module | $175 |
| 6mg 140/170 memory module | $235 |
| 4mg 160/180 memory module | $199 |
| 6mg 160/180 memory module | $275 |
| 8mg 160/180 memory module | $349 |
| 10mg 160/180 memory module | $449 |
| 4mg DUO 210/230 memory module | $199 |
| 8mg DUO 210/230 memory module | $369 |

**Global Village PowerPort Modems**

| | |
|---|---|
| Bronze (24/96 S/R fax/mdm) | $189 |
| Silver (94/96 S/R fax/mdm) | $369 |
| Gold(14,400 S/R fax/mdm) | $429 |

**PSI PowerModems**

| | |
|---|---|
| PSI PowerModem I (24/96/48 S/R fax modem) | $159 |
| PSI PowerModem III (96/96 S/R fax modem) | $349 |
| PSI PowerModem IV(14.4/14.4S/Rfax modem) | $409 |

### REMOVEABLES

**Syquest Cartridges**
**44MB–$62 88MB–$96**

**Memory Direct Removable Drives**

| | |
|---|---|
| Memory Direct 44mb External (SQ555) | $395 |
| Memory Direct 44mb Internal | $355 |
| Memory Direct 88mb External (SQ5110) | $499 |
| Memory Direct 88mb Internal | $479 |
| Memory Direct 88c External (SQ5110C)* | $599 |
| Memory Direct 88c Internal* | $569 |

*Your Memory Direct 88c will read and write, but not format, 44 mb cartridges.

### RASTEROPS

**Graphic Cards**

| | |
|---|---|
| RasterOps 24XTV | $2519 |
| RasterOps 24XLi | $2059 |
| RasterOps 24 | $1649 |
| RasterOps paintboard Li | $849 |
| RasterOps 8XLi | $999 |

**Displays**

| | |
|---|---|
| 21" Color | $2999 |
| 20" Color Multimode | $2075 |
| 20" Color Multiscan Trinitron | $2925 |

### SUPER MAC

**Displays**

| | |
|---|---|
| Super Match 21 Two-Page (9771) | $2459 |
| SuperMatch 20 Dual-Mode Trinitron (9751) | $2459 |
| SuperMatch 20•T Multimode Trinitron (9752) | $2459 |
| Super Match 20 Color (9782) | $1479 |
| SuperMatch 17 Multimode (9730) | $1159 |
| SuperMatch 17•T Trinitron (9735) | $1059 |
| Platinum 21 Two-Page Display (9761) | $999 |

**Graphic Cards**

| | |
|---|---|
| ThunderStorm | $825 |
| Spectrum/24 Series IV | $825 |
| Spectrum/24 PDQ Plus | $1525 |
| Spectrum/8•24 PDQ NuBus or IIsi | $825 |
| Spectrum 8/Series II | $415 |

**Quicktime Movie Making**

| | |
|---|---|
| VideoSpigot NuBux** / IIsi* / LC | $379/339/259 |
| Spigot & Sound NuBux* | $489 |
| VideoSpigot Pro NuBus** / IIsi** | $1079/1239 |
| Spigot & Sound Pro NuBus** | $1079 |

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| UC-840 with Adobe PhotoShop™ v2.0.1 | $1299 |
| UC-1200S with Adobe PhotoShop™ v2.0.1 | $2999 |

### HARD DRIVES

**Fujitsu** Fujitsu drives carry a FIVE Year Warranty.

| | | | | | | |
|---|---|---|---|---|---|---|
| 425MB | M2623FA | 3.5" | HH | 9ms | $905 | $965 |
| 520MB | M2624FA | 3.5" | HH | 9ms | $955 | $1015 |
| 1.2GIG | M2266 | 5.25" | FH | 14ms | $1405 | $1505 |
| 2.0GIG | M2652 | 5.25" | FH | 14ms | $2305 | $2405 |
| 2.4GIG | M2654 | 5.25" | FH | 11ms | $2529 | $2629 |

**Conner** Conner drives carry a ONE Year Warranty.

| | | | | | | |
|---|---|---|---|---|---|---|
| 85MB | CP30080E | 3.5" | LP | 17ms | $209 | $269 |
| 170MB | CP30170E | 3.5" | LP | 17ms | $299 | $359 |
| 212MB | CP30200 | 3.5" | LP | 12ms | $379 | $439 |
| 520MB | CP30540 | 3.5" | HH | 10ms | $909 | $969 |

**Quantum** ELS, LPS, PRO drives have a TWO Year Warranty
Go-drives have ONE Year Warranty

| | | | | |
|---|---|---|---|---|
| 42MB | ELS42 | 19ms | $175 | $235 |
| 85MB | ELS85 | 17ms | $215 | $275 |
| 127MB | ELS127 | 17ms | $289 | $349 |
| 170MB | ELS170 | 17ms | $319 | $379 |
| 240MB | LPS240 | 10ms | $439 | $499 |
| 425MB | PRO425 | 9ms | $879 | $939 |
| 525MB | LPS525 | 10ms | $939 | $999 |
| 700MB | PRO700 | 10ms | $1195 | $1255 |
| 1.0GIG | PRO1050 | 10ms | $1365 | $1425 |
| 1.2GIG | PRO1225 | 10ms | $1595 | $1655 |

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| NEC CD Express (CDR-25) | $405 |
| NEC MultiSpin (CDR-74) | $629 |

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| Power Cache 40 | $549 | $629 |
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| 33 Mhz Turbo 040 | | $1349 |
| FastCache Turbo 25 | | $279 |
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| ComboCache SI w/o math chip | | $219 |
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| MC3SE | Thick/Thin/10BaseT,32K | $209 |
| MC+SEET | Thick/10BaseT, 32K | $159 |
| **SCSI Products** | | |
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| **FriendlyNet Adapters** | (All models) | $89 |
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| AP1002 | AsantePrint, Thik/Thin | $329 |
| AP 101 | Asante Print, Thick/10BaseT | $329 |
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| MC+IIE64 | Thick/Thin, 64K | $159 |
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| MC 311SI | Thick/Thin/10BaseT, 64K, FPU Socket | $209 |
| MC+30IE64 | Thick/Thin/64K, FPU Socket | $159 |
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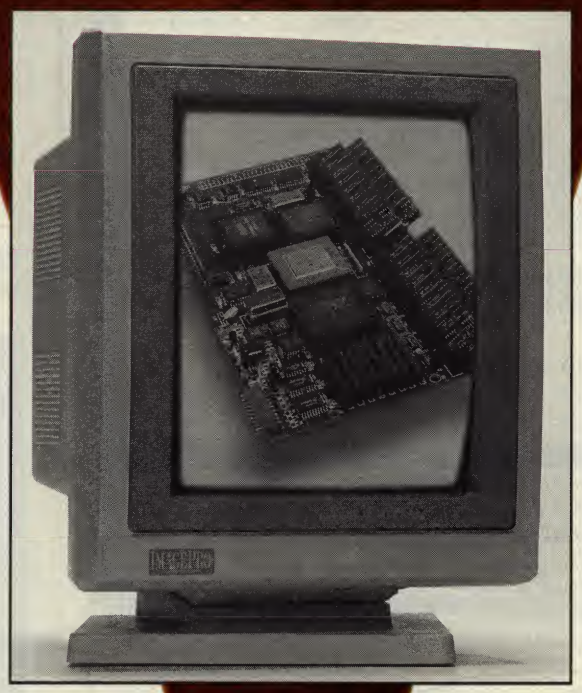
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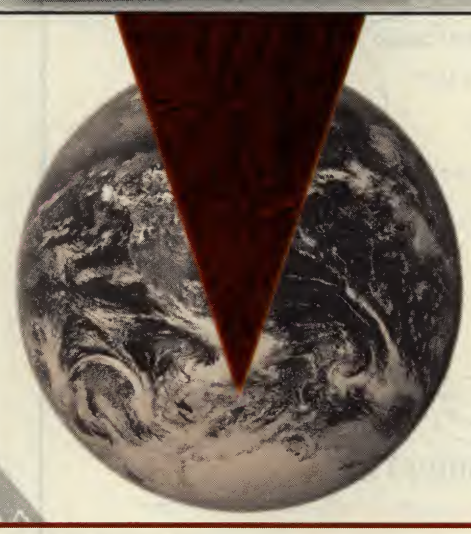
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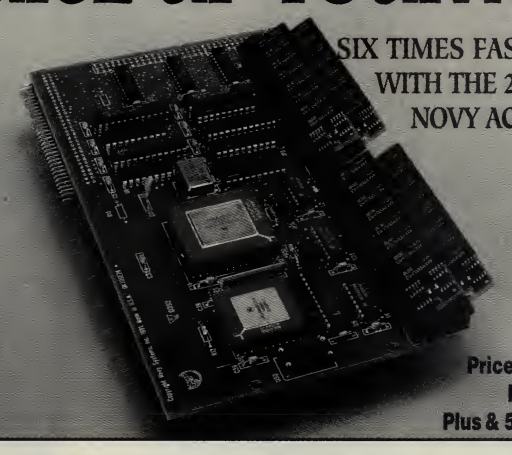
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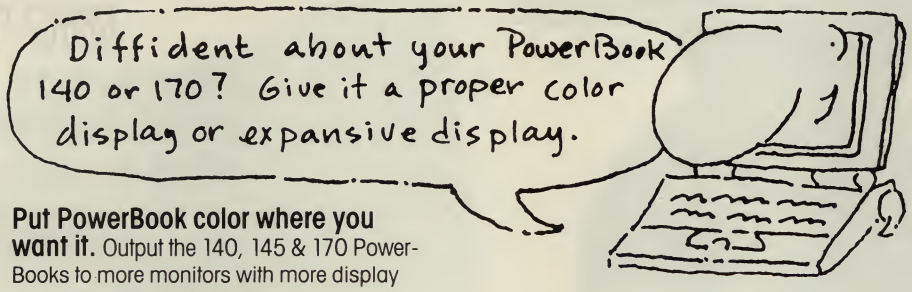
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| Duo 230 | 4-40/80 | $2195/2290 |
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| 2112 | 1035 | 3.5 | 10 | $1230 | $1292 |
| 1598 | 1049 | FH | 14 | $1434 | $1515 |
| 1528 | 1345 | FH | 14 | $1710 | $1784 |
| 1908 | 1405 | FH | 10 | $1890 | $1959 |
| 1548 | 1748 | FH | 14 | $1914 | $1983 |
| 1924 | 2070 | FH | 11.5 | $2514 | $2568 |
| 1936 | 3022 | FH | 12 | $3534 | $3562 |

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5 YEAR WARRANTY

| TYPE | MB | SIZE | SEEK | INT. | EXT. |
|---|---|---|---|---|---|
| M2623FA | 425 | 3.5 | 12 | $797 | $891 |
| M2624FA | 520 | 3.5 | 12 | $770 | $862 |
| M2266S | 1079 | FH | 14 | $1195 | $1312 |
| M2694 | 1080 | 3.5 | 10 | $1489 | $1581 |
| M2652S | 1750 | FH | 11 | $2083 | $2200 |
| M2654S | 2061 | FH | 11 | $2277 | $2395 |

### DEC
5 YEAR WARRANTY

| TYPE | MB | SIZE | SEEK | INT. | EXT. |
|---|---|---|---|---|---|
| DSP3085S | 850 | 3.5 | 9.5 | $1212 | $1307 |
| DSP3105S | 1050 | 3.5 | 9.5 | $1248 | $1343 |
| DSP3160S | 1660 | 3.5 | 10 | $1782 | $1877 |
| DSP5200S | 2000 | FH | 12.5 | $1939 | $2056 |
| DSP5350S | 3500 | FH | 11.5 | $ 3300 | $ 3421 |

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| TYPE | MB | SIZE | SEEK | INT. | EXT. |
|---|---|---|---|---|---|
| ST1480N | 430 | 3.5 | 14 | $795 | $889 |
| ST1581N | 525 | 3.5 | 14 | $886 | $980 |
| ST3600N | 540 | 1" | 10.5 | $859 | $953 |
| ST4767N | 665 | FH | 12 | $1228 | $1345 |
| ST1980N | 860 | 3.5 | 9.9 | $1082 | $1175 |
| ST41200N | 1037 | FH | 16 | $1082 | $1199 |
| ST11200N | 1037 | 3.5 | 10.5 | $1199 | $1259* |
| ST41600N | 1420 | FH | 15 | $1755 | $1872 |
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| LPS525S | 525 | 1" | 10 | $915 | $1007 |
| PD700S | 700 | 1" | 10 | $1155 | $1247 |
| PD1050S | 1050 | 3.5 | 10 | $1324 | $1416 |
| PD1225S | 1200 | 3.5 | 10 | $1503 | $1595 |

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| **765 MB** | M1624 | 5.25" 14 MS, 5 yr. War. Fast SCSI-2 | **$1199** | **$1264** |
| **1.2 GB** | M2112 | 3.5" 10 MS, 5 yr. War. Fast SCSI-2 | **1599** | **1659** |
| **1.2 GB** | M1598 | 5.25" 14 MS, 5 yr. War. Fast SCSI-2 | **1499** | **1619** |
| **2.0 GB** | M1548 | 5.25" 14 MS, 5 yr. War. Fast SCSI-2 | **1999** | **2119** |
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| **1.2 GB** | M2694 | 3.5" | 8.5 MS, 5 Yr. War. Fast SCSI-2 | **1675** | **1735** |
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| 127MB | ELS/17MS | $265 | $325 |
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| 700MB | PRO/10MS | $1189 | $1249 |
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| Capacity | Description | Internal | External |
|---|---|---|---|
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| 88MB | $99 | $96 |

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| 5.0GIG* | DAT COMP. | $1479 |

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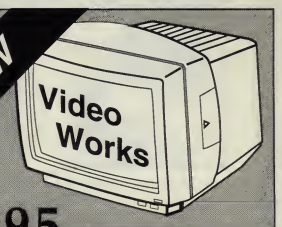
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|---|---|---|---|
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| Capacity | Description | Internal | External |
|---|---|---|---|
| 520MB* | M2624FA/9MS | $945 | $1005 |
| 1.2GIG* | M2266/14.5MS | $1397 | $1497 |
| 2.0GIG* | M2652/14.5MS | $2289 | $2389 |

All internal drives come with mounting brackets, cable and Drive7 software. All external drives come with a universal power supply, power cable, SCSI cable and Drive7 software. All items carry manufacturer's warranty. All prices and information are subject to change without notice. No refunds on freight. All returned items require an RMA number. A 15% restocking fee may apply.

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$995

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Mac or IBM compatible
Up to 1280 x1024
1 Year Warranty
30 day money-back guarantee

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| Transparency/Slide Adapter | $699. |

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| Texel External W/sw bundle | $559. |
| NEC External W/sw bundle | $CALL |
| Trantor CD Rom Software kit | $39. |

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| Micropolis 560mb Internal | $999. |
| Fujitsu 535mb 9msec Internal | $999. |
| Quantum 240mb Internal | $CALL |

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| ProColor Server 8 • 16 | $369. |
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Now your Mac can be a fax and a data modem, too, and with U.S. Robotics reliability built in. U.S. Robotics new Sportster 14,400 Mac&Fax turns your Mac into multi-talented fax machine and Faxstf™ software lets you send faxes to any other fax machine or fax board, anywhere, and print them out on a laser printer.Mac&Fax Sportster: 14,400 CCITT V.32 bis with V.42 bis– 14,400 bps throughput, compatible with 300, 1200, 2400, and 9600 bps CCITT standards, 9,600 bps send and receive Group III Fax, V.42/MNP 2-4 error control and V.42 bis/ MNP 5 data compression.

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Classic 3 Meg. Card w/1 Meg. ..... 49
1 Meg. - 1M x 8 - 120 ..... 26
1 Meg. - 1M x 8 - 100 ..... 29
1 Meg. - 1M x 8 - 70 ..... 32
2 Meg. - 2M x 8 - 80 ..... 59
4 Meg. - 4M x 8 - 80 ..... 119
4 Meg. - 4M x 8 - 70 ..... 129
8 Meg. - 8M x 8 - 80 ..... 279
16 Meg. - 16M x 8 - 80 ..... 499
16 Meg. - 16M x 8 - 80 (Low) .... 529
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8 Meg. - 8M x 8 - 80 (IIfx) ..... 299
16 Meg. - 16M x 8 - 80 (IIfx) ..... 599

### Mac Centris, Color Classic, LCIII, Quadra 800

1 Meg. - 1M x 8 - 70 (72pin) ..... 129
1 Meg. - 1M x 8 - 60 (72pin) ..... 139
2 Meg. - 2M x 8 - 70 (72pin) ..... 259
2 Meg. - 2M x 8 - 60 (72pin) ..... 269
4 Meg. - 4M x 8 - 70 (72pin) ..... 159
4 Meg. - 4M x 8 - 60 (72pin) ..... 189
8 Meg. - 8M x 8 - 70 (72pin) ..... 329
8 Meg. - 8M x 8 - 60 (72pin) ..... 369
16 Meg. - 16M x 8 - 70 (72pin) . 699
16 Meg. - 16M x 8 - 60 (72pin) . 849

### Video Memory:

Mac LC - 512K Video SIMM ..... 49
Quadra 700 - 256K Video SIMM . 29
Quadra 900 - 256K Video SIMM . 29
Quadra 950 - 256K Video SIMM . 29

*All SIMMS have a limited lifetime warranty! Call for latest prices!*

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Powerbook 100 - 4 Meg. Card .. 179
Powerbook 100 - 6 Meg. Card .. 229
Powerbook 140/170 - 4 Meg. .... 159
Powerbook 140/170 - 6 Meg. .... 209
Powerbook 160/180 - 6 Meg. .... 229
Powerbook 160/180 - 8 Meg. .... 349
Powerbook 160/180 - 10 Meg... 449
Powerbook 210/230 - 8 Meg. .... 399
Powerbook 210/230 - 10 Meg... Call
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### Accelerators & Cache:

Co-Processor - Mac LC ..... 79
Co-Processor - Mac Classic II ..... 79
IIci Cache Card ..... 169
IIsi Cache w/FPU Socket ..... 149
IIsi Cache w/FPU Installed ..... 199
Classic Accel w/Co-Processor ... 199
SE Accelerator w/Co-Processor . 279
Quadra 700/900 Accelerator .... 299
7VS-A Increases processor speed from 25MHz to 30MHz!
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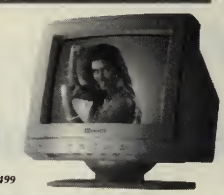
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Color Pivot Video Board ..... 499
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Radius RocketShare ..... 399
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The 3-in-1 (Thick, Thin and 10BaseT) Ethernet card for most expandable Macintoshes including the IIsi and SE/30. Not available for the LC or LCII.

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**Asanté FriendlyNet Adapters ..... 69**
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**Asanté Print ..... 349**
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LocalSwitch is a 16-port intelligent packet-switching hub for Macintosh networks. Using standard LocalTalk protocol and twisted pair wiring, LocalSwitch processes many network transmissions simultaneously.



**$1,499** Tribe LocalSwitch

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**$99**




**MAK-105 "Tactile Click" ADB interface**
**compatible extended keyboard for Mac SE and Mac II series, 105 keys layout, 15 built-in function keys, Numeric keypad, T-style cursor pad, 6 cursor-control keys and enlarged Return key ..... 99**

## CoStar



**Stingray Trackball** **$89**

**Stingray Trackball ..... 89**
**ADB interface with automatic acceleration. Precision-engineered for accuracy and reliability, and ergonomically designed for maximum comfort and ease of use. Sleek, compact design uses less desk space.**



**$439** **AddressWriter personal envelope and label printer**

**AddressWriter Printer ..... 439**
144 x 144 impact dot-matrix print head. Optional label feeder will handle a variety of pin-fed labels for added convenience and value. Specify voltage.



**LabelWriter II & LabelWiter II Plus personal label printers**

**$179** CO STAR

**The LabelWriter II and II Plus use direct thermal input technology to produce high-quality labels in a variety of sizes. The LabelWriter can be attached directly to your computer or AppleTalk Network.**

**LabelWriter II Mac ..... 179**
Handles up to 350 labels per roll. Maximum label size: 1-1/8" x 3-1/2". Prints one label in 3-1/2 secs.

**LabelWriter II Plus Mac ..... 249**
Handles up to 700 labels per roll. Maximum label size: 2-1/4" x 4". Prints one label in 3-1/2 to 7 secs.

## 300/600/800/1,200 dpi Color & Grayscale Scanners



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**Tamarack 600 Color Scanner:**
24-Bit Color - 8.5" x 11.5" ..... 979
Slide Attachment (shown) ..... 549
PhotoShop LE (limited version)* ... 99
PhotoShop 2.0 (full version)* ..... 199

**Relax Color: (Epson Engine)**
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300 dpi - 110 VAC ..... 999
300 dpi - 220 VAC ..... 1,099
Color Studio LE (limited version)* .... 79
Color Studio 1.5 (full version)* ..... 159

**Umax Color Scanners:**
UC630** - 8.5" x 14"
24-Bit 600 dpi w/PhotoShop ... 1,079
Transparency/Slide Attachment . 789
Auto Document Feeder ..... 479
UC1200S** - 8.5" x 14"
24-Bit 1,200 dpi w/PhotoShop 2,999
Transparency/Slide Attachment . 889

**Relisys Color Scanner:**
ColdScan 800 - 8.5" x 14"
24-Bit 800 dpi ..... 1,099
PhotoShop LE (limited version)* ..... 99
PhotoShop 2.0 (full version)* ..... 199

** with purchase of scanner, ** includes PhotoShop*

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**16 Million Color - 300/600 dpi**

*An affordable, quality, flatbed 8-1/2" x 11", 24-bit color scanner for business and professional use.*

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*The Sharp JX-320 is the first color scanner fully compliant with the new SCSI-2 standard which eliminates the need for special drivers .*

*Includes the full version of PhotoShop. OCR compatible. Built-in command set includes: downloadable Gamma Tables; Edge Emphasis; Brightness; and, Lightness. 110 VAC only.*

**Sharp JX-320 Color Scanner ..... 999**
**Transparency Option JX-32F3 ..... 799**

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*The Océ G5241 puts the power of color PostScript® printing on your desktop using a true Adobe® PostScript interpreter. Using the thermal transfer method, the G5241 prints either 3 or 4 color on letter or A3 size, paper or overhead transparencies at 300 dpi.*

**$1,999**

*The Océ G5232 has all the great qualities of the G5241 but increases the printing capability to tabloid size pages at 300 dpi. True PostScript®, 35 Adobe fonts in ROM, downloadable fonts sup-ported. 8Mb Ram, 20Mb hard drive.*

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Reads and writes both 44 and 88 Meg. cartridges!

| Cartridge | 1 to 4 | 5 and Up |
|---|---|---|
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DIVA VIDEO Shop
Diva Video Shop Plus Megs of QuickTime Movies *FREE* on Every Cartridge !!



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IOMEGA

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• • 150 megabytes of storage in each data cartridge. Includes cartridge, software and cables.

5-year warranty on all data cartridges!

Cartridges - $169

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2.0 Gig. DAT Tape
Retrospect software & tape included!
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EXABYTE

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Selected for performance, value and service. Quality at low cost. Perfect for backing up hard disks up to 600 megabytes. Complete package includes software, cables and media. MACWORLD - 12/92.
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Includes your choice standard Mac or PowerBook case and a PowerBook or standard Macintosh SCSI Cable.



**External PowerBook Case Kits.**
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**FreeLance Options:**
Adapter - DB25M/HDI30 ..... 29
Gray Case & ADB pwr. cable .... 70
Platinum Case & ADB pwr.cable 70
SCSI Cable - DB25M/DB25M .... 19
SCSI Cable - DB25M/Cent50M .. 19

## Premium Hard Disk Drives - Macintosh

### Seagate 3-1/2" Half Height

| | Internal | External |
|---|---|---|
| 240 Meg. - ST3283N, 12 ms. | 439 | 499 |
| 510 Meg. - ST1581N, 14 ms. | 939 | 999 |
| 1.0 Gig. - ST11200N, 14 ms. | 1,369 | 1,429 |
| **5-1/4" Full Height - WREN** | | |
| 1.0 Gig. - ST41200N, 15 ms. | 1,239 | 1,339 |
| 1.4 Gig. - ST41651N, 15 ms. | 1,699 | 1,799 |
| 1.9 Gig. - ST42100N, 12.9 ms. | 1,939 | 2,039 |
| **5-1/4" Full Height - ELITE Ultra-High Performance** | | |
| 1.4 Gig. - ELITE-I, 11.5 ms. | 1,939 | 2,039 |
| 2.1 Gig. - ELITE-II, 11 ms. | 2,849 | 2,949 |
| 3.5 Gig. - ELITE-III, 11 ms. | 3,439 | 3,539 |

### Fujitsu 3-1/2" Half Height

| | | |
|---|---|---|
| 520 Meg. - 2624FA, 9 ms. | 939 | 999 |
| 1.2 Gig. - 2694SA, 8.5 ms. | 1,639 | 1,699 |
| **5-1/4" Full Height** | | |
| 1.2 Gig. - 2266SA, 11.5 ms | 1,399 | 1,499 |
| 2.0 Gig. - 2652SA, 11.5 ms | 2,299 | 2,399 |

### Maxtor 3-1/2" Low Profile/Low Power

| | | |
|---|---|---|
| 120 Meg. - 7120S, 15 ms. | 249 | 309 |
| 213 Meg. - 7213S, 15 ms. | 359 | 419 |
| **5-1/4" Full Height** | | |
| 645 Meg. - XT8760, 16.5 ms. | 1,299 | 1,399 |
| 1.7 Gig. - Panther, 13 ms. | 1,699 | 1,799 |

### Conner 3-1/2" Half Height

| | | |
|---|---|---|
| 42 Meg. - CP-3040, 25 ms. | 179 | 239 |
| 85 Meg. - CP-30080E, 17 ms. | 199 | 259 |
| 120 Meg. - CP30100, 19 ms. | 279 | 339 |
| 170 Meg. - CP-30170E, 17 ms. | 299 | 359 |
| 212 Meg. - CP-30200, 12 ms. | 379 | 439 |
| 545 Meg. - CP-30540, 8.5 ms. | 909 | 969 |

### Hewlett Packard 3-1/2" Half Height

| | | |
|---|---|---|
| 422 Meg. - HP2235, 12.6 ms. | 1,039 | 1,099 |
| 1.2 Gig. - HP2247, 12.6 ms. | 1,539 | 1,599 |
| **5-1/4" Full Height** | | |
| 1.2 Gig. - HP97558, 13.5 ms. | 1,639 | 1,739 |
| 1.6 Gig. - HP97560, 13.5 ms. | 1,989 | 2,089 |

### Quantum 3-1/2" ELS Low Profile

| | Internal | External |
|---|---|---|
| 42 Meg. - ELS42, 19 ms. | 189 | 249 |
| 85 Meg. - ELS85, 17 ms. | 219 | 279 |
| 127 Meg. - ELS127, 17 ms. | 269 | 329 |
| **2-1/2" - Internal for the Mac PowerBook only** | | |
| 80Meg. - Go•80, 17 ms. | 329 | 429 |
| 120 Meg. - Go•120, 17 ms. | 429 | 529 |
| 160 Meg. - Go•160, 17 ms. | 579 | 679 |
| **3-1/2" PDS, PRO & LPS Series** | | |
| 240 Meg. - LPS240, 10 ms. | 419 | 479 |
| 525 meg. - LPS525, 10 ms. | 939 | 999 |
| 1.0 Gig. - PD1050S, 11 ms. | 1,329 | 1,389 |
| 1.2 Gig. - PD1225S, 11 ms. | 1,459 | 1,559 |

Quantum



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Verbatim®

| Verbatim Media: | 1 to 4 | 5 + |
|---|---|---|
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Mac Utilities v1.25 ..... 19




Software Architects Formatter One and Formatter Five offer partitioning, AU/X compatibility, Testing, DOS Support and much more.
Formatter One ..partitioning,AU/X ..... 49
Formatter Five ..Dos Support ..... 159




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Hard Drive ..partitioning, AU/X ..... 39
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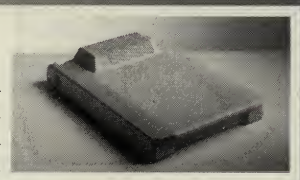
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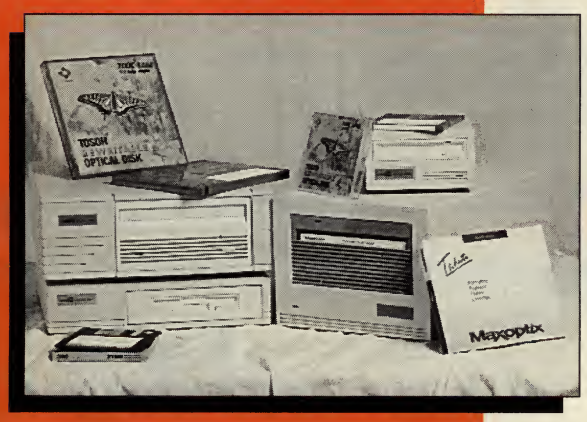
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| 560Meg | 10ms | 5400 | Micropolis | 5 Years | $1059 | $1139 |
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| 650Meg | 27ms | Hewlett Packard | MultiFunction | $2559 | $2599 |
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| Media | 20Meg | 20Meg 5 pack | 128Meg | 128Meg 5 pack | 650Meg | 650Meg 5 pack | 1Gig | 1 Gig 5 pack |
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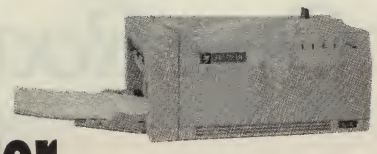
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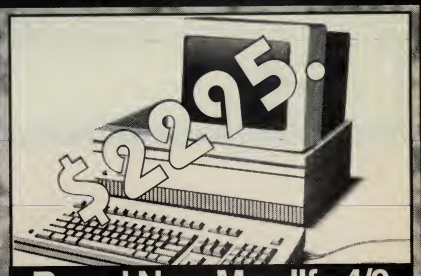
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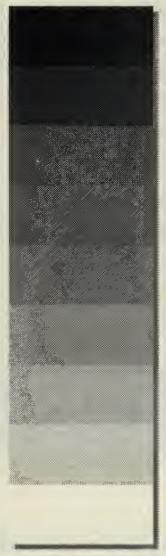
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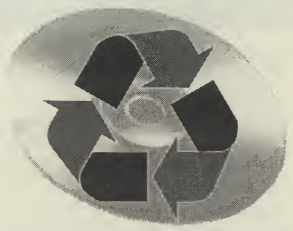
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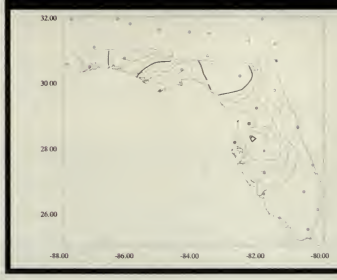
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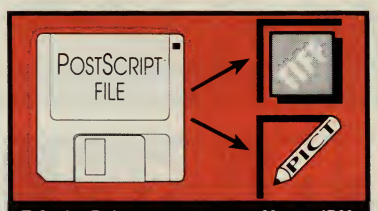
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## intermedia

*From Page 1*

will ship this summer for less than $500 (see MacWEEK, March 29).

▸ **QuickTime 1.6.** In private showings, Apple demonstrated QuickTime 1.6, an upgrade due this spring. The new version will play movies "smoother and faster," import sound from CD sources, and smooth text when movies are resized. It will support ColorSync, Apple's new color-matching technology, as well as 16-bit gray scale on PowerBooks and Duos.

The company also previewed its new Sound Manager, due in concert with QuickTime 1.6, which will let Macs with third-party sound cards record and play CD-quality 16-bit sound.

Apple said the next version of QuickTime for Windows will support Microsoft Corp.'s MCI (Media Control Interface) and OLE (Object Linking and Embedding), allowing current Windows applications to incorporate QuickTime movies.

▸ **Photo CD.** Eastman Kodak Co. unveiled its Photo CD Portfolio software, which will let users author their own Photo CDs of photos, graphics, sound and text (see MacWEEK, March 29).

The company also demonstrated Photo CD Portfolio Player Emulator, software that will let Macs and Windows machines play back Portfolio presentations.

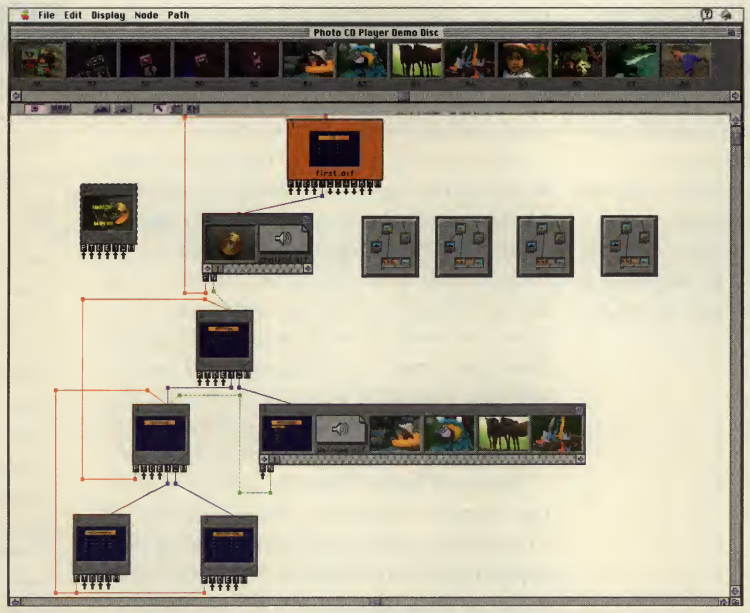
▸ **CD authoring systems.** Philips Consumer Electronics Co. announced an $8,995 recording system that pairs the company's CD-ROM recorder with its new MacOnCD software (see MacWEEK, March 29).

Meridian Data Inc. showed Netscribe 1000, a $13,995 authoring system that runs over Novell NetWare networks, allowing multiple users to create CDs. Netscribe 1000, which uses Kodak's PCD writer 200 recorder, will add Mac client support by the end of the summer. Kodak will market the same system as the Kodak PCD LAN writer 200.

Optical Media International highlighted its new CD authoring software, which supports a hybrid CD-ROM format combining the Mac's hierarchical file format with the ISO 9660 standard, allowing a single CD to be read on Macs, IBM PCs and compatibles, and Unix machines. A CD authoring system that includes the software and a CD recorder lists for $8,500.

▸ **Macromedia.** Macromedia Inc. and Apple said that three Macromedia products, the $495 Action!, $295 SoundEdit Pro and $295 ClipMedia Sampler, will be bundled free with Apple's CD-ROM drives and Macs with built-in CD-ROM drives.

Macromedia also announced that three of its products, MacroMind Director, MacroModel and Three-D, will be bundled free with The 3DO Company's Authoring Toolkit for 3DO developers. 3DO licensed Director's file format, enabling users of the forthcoming 3DO Interactive Multiplayer to play back Mac Director files.




**Kodak showed intermedia attendees its Photo CD Portfolio software for authoring multimedia discs that include digital photos, audio files, graphics and text.**

▸ **Microsoft CD-ROM.** Industry giant Microsoft Corp. introduced its first entertainment CD-ROM title for the Mac. The $79.95 Microsoft Musical Instruments, due this summer, will offer users historical information, photographs and sounds of more than 200 musical instruments.

▸ **Future directions.** The conference featured a "converging industries panel" that included Apple CEO John Sculley, Microsoft Corp. CEO Bill Gates, TeleCommunications Inc. (TCI) CEO John Malone and QVC Network Inc. CEO Barry Diller.

Malone said that by November, TCI, the country's largest cable TV company, will cablecast interactive multimedia TV programs to $350 electronic boxes attached to televisions. He predicted that 14 million homes served by TCI will be wired for the new services by mid-1996.

Macromedia founder Marc Cantor jabbed at current CD-ROM technology and content as boring. "The machines are too slow, and the graphics aren't happening. Turn on MTV; it's much more exciting," he said.

Gates defended CD-ROM as a training ground for developers interested in future high-speed interactive media. □

## Europe

*From Page 1*

structure internal to the program and define their own fields and keywords for identifying and retrieving those files. A 32-Kbyte field can hold comments or can be filled automatically with the first 32,000 characters of a text document.

Selected files can be displayed in a resizable thumbnail view. For files that are still in their native file format, the creator application can be launched directly; files in text, PICT, QuickTime or scanned-image format can be viewed within ArchIS. With graphics files users can attach voice or text annotations; zoom in and out; and resize, rotate or crop images.

ArchIS can take in images directly from scanners or video camera; scanned documents can be converted to text using the optional optical character recognition capability. A dithering scheme increases the readability of scanned-text documents.

ArchIS Documentation has all the features of ArchIS File plus much more extensive keyword fields and the capability to search based on relationships entered in its thesaurus.

For example, if a user searches for the keyword "rock" and has the synonym-matching feature enabled, ArchIS would also find documents stored with the keyword "stone." The system also allows searches based on class hierarchies; if the user searches for documents with the keyword "Macintosh," ArchIS can also find documents with the keyword "Performa."

Users can define their own keyword relationships, classes and synonyms. ArchIS supports compound searches and Boolean operators.

ArchIS can store files and catalogs on separate servers to speed access, and it can be connected to front ends created with HyperCard or ACI Inc.'s 4th Dimension. According to SoftCore, the system is capable of handling terabytes of data.

A single-user version of ArchIS File retails for $3,000; ArchIS Documentation costs $6,000. The programs are available directly from SoftCore, but the company plans to set up a U.S. office by early next year.

▸ **IsoDraw.** Available in Europe for more than two years, IsoDraw counts Volkswagen, BMW, Mercedes-Benz and Ford Motor Co. among its users. But officials of its developer, Itedo Software GmbH, said that until recently it didn't think the company would have enough credibility with major U.S. companies to enter the market.

IsoDraw is a drawing program geared to helping users rapidly create technical illustrations. The difference between IsoDraw and a standard CAD program, according to the company, are tools that are designed specifically for creating isometric objects. For example, the product has a complete set of ellipses that can be added to the isometric plane. Line thicknesses are automatically assigned by the program as a "best guess," but users can alternate thicknesses just by clicking. With a few clicks of the mouse, users can extrude an ellipse and add threads to create a screw.

IsoDraw retails for about $4,200. The company is now selling the product directly to U.S. customers and looking for a U.S. distributor.

▸ **XLib for Macintosh.** A development kit from Mac-Info-Link gives developers of X Window applications a way to bring their software to the Mac.

XLib for Macintosh is a port of the X Library X.11 Revision 5 to System 7. With it developers can run their X Window applications on a Macintosh, making them accessible both to Macs running MacX and to X Window terminals.

XLib retails for $298. It is available direct from Mac-Info-Link.

S.A. SoftCore N.V. is at Avenue De Beaulieulaan 25, 1160 Brussels, Belgium. Phone (32) 2-673-99-03; fax (32) 2-660-10-76.

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## AppleScript

*From Page 1*

August's Macworld Expo in Boston, and there will be more than 100 by the end of the year.

Each scriptable application includes a dictionary of terms that adds verbs (commands) and nouns (application-specific data elements) to AppleScript. For instance, a paging application would add both a command to "send a message" and a relevant data structure, such as phone numbers.

AppleScript "lets you manipulate data across applications as if they were one huge object-oriented application," said Charles Piercey, AppleScript product marketing manager.

Scripts are compiled into a generic form that can be displayed in different human-readable languages through what Apple calls dialects. For instance, a script could be written in an English dialect and then displayed in kanji, with fonts changed and words automatically reordered to match kanji grammar. Extensions that add kanji, romaji (Japanese in the Roman alphabet) and French dialects will be released this spring.

Apple said it will not release the specifications necessary for third-party developers to create their own dialects. However, developers of other scripting systems, such as UserLand Software Inc. of Redwood City, Calif., will be able to implement their own languages as components of Apple's Open Scripting Architecture (OSA), so AppleScript tools and scriptable applications will be able to work with non-Apple systems.

Initially AppleScript will be available only through APDA, Apple's mail-order distribution arm for programmer tools, but a retail package aimed at solutions developers will be released later this year.

▸ **The AppleScript Developers Toolkit,** a $199 CD-ROM, will ship in two weeks through APDA. The disc, aimed at helping commercial developers add AppleScript support to their applications, will include the AppleScript extension and a simple script editor, along with language documentation and other tools. Prerelease versions of the kanji and romaji dialect components will also be included.

▸ **A $20 AppleScript runtime kit** will also be released this month through APDA. The package will include the fully functional AppleScript extension and editor, some sample scripts, and documentation for using scripts but none for writing them.

▸ **A retail package** aimed at in-house developers, consultants and value-added resellers is due by the end of the year; pricing has not been set. It will include an advanced script-editing application now under development at Apple; in addition, the company said, it may include some third-party utilities and a module that adds support for Data Access Language.

The next version of HyperCard, which Apple is in the process of taking back from its Claris Corp. subsidiary, will be based on AppleScript, officials said.

By the end of the year, Apple expects to complete a version of its OSA for Microsoft Windows, , officials said. Although it will not allow users to create cross-platform scripts, moving OSA to Windows will make it easier for developers to port scriptable applications between platforms. □

## Warranty

*From Page 1*

defective products for replacement units at AASPs, sources said.

▶ **Phone support.** Beginning this week, users can call a toll-free hot line for assistance on installation, troubleshooting, configuration and compatibility of any Apple products except developer tools. The line will also offer third-party support referrals.

The number, (800) 767-2775, will be staffed Monday through Friday 6 a.m. to 6 p.m. Pacific time.

In addition, interactive voice-response and FAX-on-Demand systems will handle calls around the clock. Apple will also launch a new support area on AppleLink this week.

Previously, Apple offered toll-free support only for Performas and PowerBooks.

In related news, Apple's Enterprise Systems Division this week is expected to announce a variety of on-site support programs for corporate sites with hundreds of Macs, sources said. Reportedly included among the services will be 24-hour technical support for Apple's new Workgroup Servers, dedicated on-site support personnel and personalized training.

For sites that have long demanded better support from Apple, the news was welcome. "As we expect to build mission-critical applications, put them on [Apple] servers and rely on them, I need some vehicle for support," said Richard Pusbach, a Workgroup Server 95 beta tester and network manager with Prudential Bank and Trust Co. of Atlanta. "If I have to subsidize support to get it 24 hours, OK. But then I don't want an operator telling me all support people are busy. I want an engineer."

Stephen Clancy, associate director of desktop support services for Dataquest Inc. of Framingham, Mass., said changes in Apple's support policy are necessary for the computer maker to keep pace with its PC competitors. "Every major vendor is providing user support on two to four levels. You have to satisfy both the everyday user and corporate sites," Clancy said. "Apple had to do this now." □

*April Streeter contributed to this report.*

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## PowerPC

*From Page 1*

"win, place and show" in the marketplace. In addition to its own SPARC processor design, the company has already committed to supporting Intel Corp.'s x86 architecture; a version of Solaris for 486 and Pentium processors is slated for release in May at $795.

Apple will offer two OS options of its own when it begins shipping PowerPC-based Macs in the first half of next year: A version of System 7 will come standard, while PowerOpen, a Unix implementation the company is developing jointly with IBM Corp., will be available to customers who require standards-based open systems (see MacWEEK, March 22).

In addition to supporting applications written for IBM's AIX, PowerOpen will include emulation software enabling users to run the Finder and Mac-OS applications, including those developed for the 680x0 platform as well as those designed specifically for PowerPC Macs.

Solaris, in contrast, will probably give PowerPC-Mac users access to Windows applications. Sun has recently demonstrated emulation technology that runs most mainstream Windows applications under SPARC and Intel versions of Solaris. SunSoft's PowerPC announcement, made at a developers' conference last week, did not mention the Windows capability, but spokeswoman Shernaz Daver said, "It's safe to assume that anything we provide for Solaris on the SPARC or x86 platforms will also be on the PowerPC version."

Solaris will not be the last OS for the PowerPC, either. Taligent Inc.'s object-oriented system, which will probably become available in 1995, will also support the chip, and through a system of "personalities" it will allow users to run applications originally written for several older operating environments.

In addition, executives of Microsoft Corp. have said in the past that they would consider porting Windows NT, which already runs on MIPS and Alpha as well as Intel architectures, to PowerPC if there is sufficient demand in the marketplace. Officials of the Redmond, Wash., company had no comment last week. □

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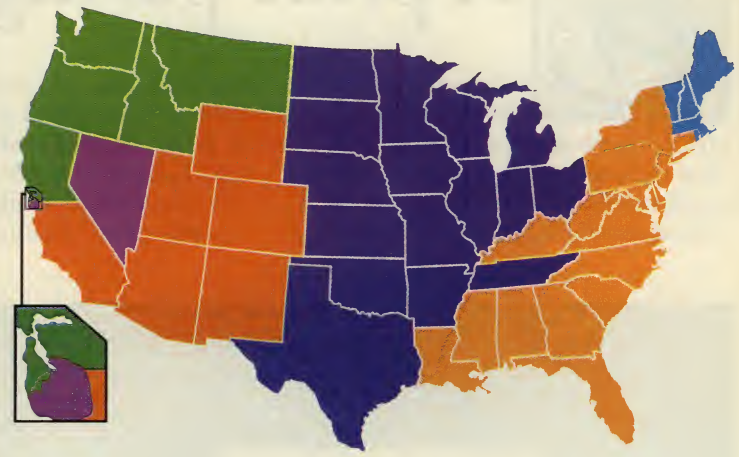
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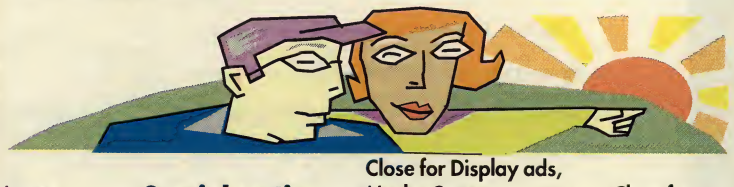

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## Looking ahead



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# A price paring proposition

Those of us who weren't otherwise occupied last week monitoring the Senate Arms Services Committee or passing along mostly tasteless jokes about beta-testing procedures practiced in Redmond, Wash., found reason to celebrate. Give Lou Gerstner an Oreo and a glass of milk (Camel Wide optional) and let him tackle IBM's long list of problems. Based on reports dropped in the Knife's in-basket Apple has its own agenda to tend to.

Lurking somewhere near the top of that list is the growing realization that the Mac's recent sales success can't continue forever without some additional bold action on Apple's part. According to the company's own estimates, as much as three-quarters of its sales are to its installed base. And while the cash of the previously installed is as green as any cash around, it's clear to Apple that it will need to gain additional market share if it wants to enjoy continued growth.

Apple is probably right on in its conclusion that its products are already competitive in performance. That leaves price. So it should come as no surprise that the company has yet another round of price cuts in the works, probably by August. Sources say that Apple currently considers most of its product line, including the wildly successful PowerBooks, fair game for this cost-reduction plan.

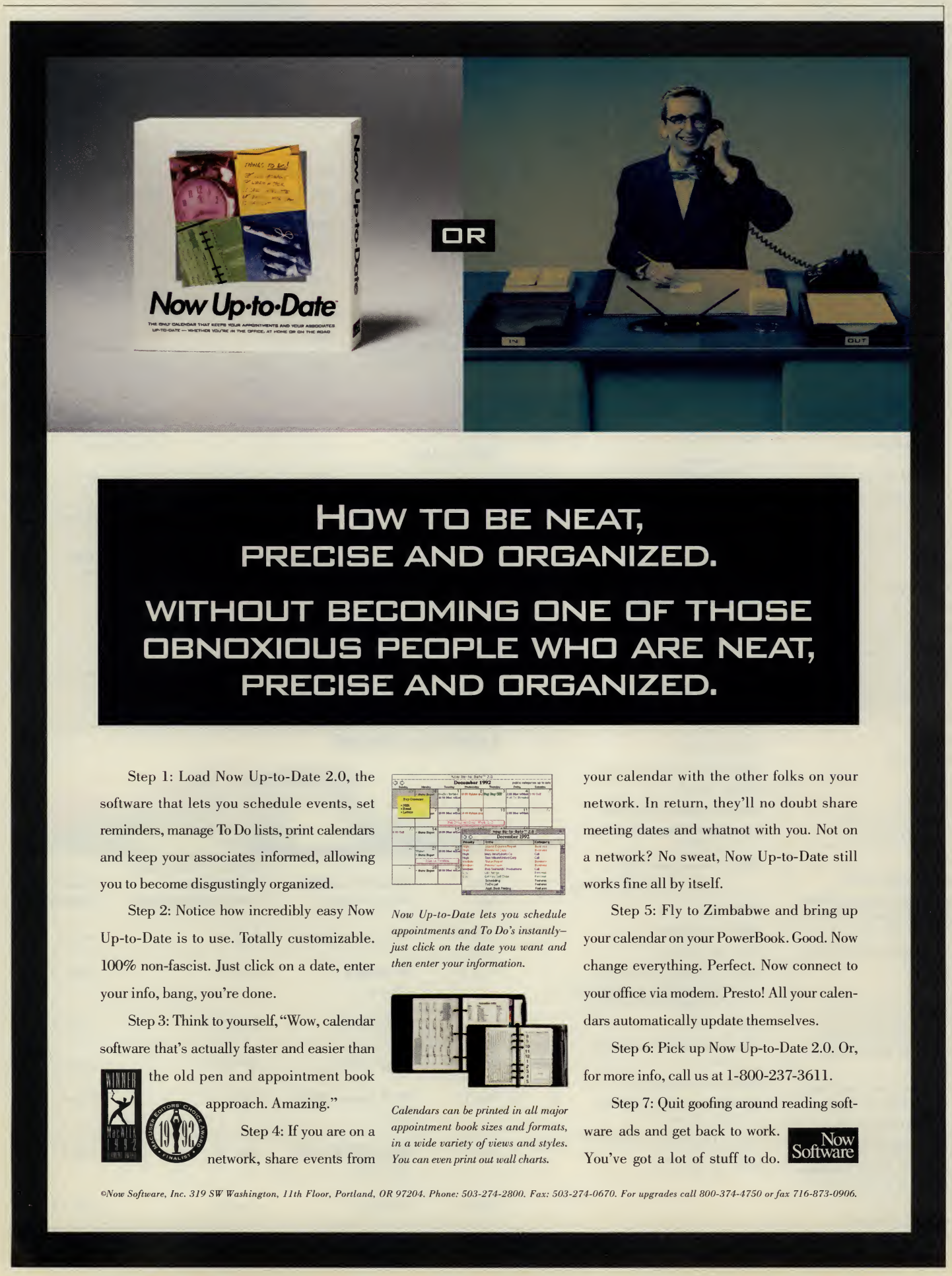
**Background logic.** The Knife agrees that an aggressive price-reduction strategy makes a great deal of sense. Although there are several new Mac models in the pipeline for introduction this year, they alone aren't sufficient to give Apple the market-share increase that has become the object of its desire. For those short of memory, the new models include an active-matrix color version of the PowerBook 180, an active-matrix gray-scale Duo and a 14-inch color Classic. This latter model, by the way, reportedly will offer LC III-class performance, thus further confusing Apple's low-end color lineup.

Of course, reduced prices generally mean reduced margins. This is a situation that will become only more acute with the passage of time and the introduction of new products. Sources speculate that the Newtons, for example, will arrive with the slimmest margins of any Apple CPU in recent memory. While this is good news for volume buyers and the shrinking middle class alike, it doesn't bode well for your job security if you happen to be employed by Apple. Experience has shown that as margins go, so goes the payroll.

**The color of indifference.** It's helpful to remember that Apple's planners are most definitely not infallible. If they were, the Apple Color Printer, arguably the centerpiece of Apple's recently announced color strategy, would be one hella hot product. Alas, dealers are reporting that sales of the unit range from flat to nonexistent. Dealers are advocating the all-purpose price reduction as the solution that will get these boxes moving.

**Bin basket.** It would be nice if a price cut were the magical solution to every problem that Apple is experiencing, but such is not the case. Some problems require plain old American engineering. That's undoubtedly the case with a few problems with Apple products that were brought to the Knife's attention last week. In this category we find the PowerBook AutoRemounter control panel, which has a disturbing tendency to start an AppleTalk packet echo volley that can bring even the strongest network to its knees. Add to this list the mysterious PowerBook 165c-related battery and power adapter concerns that just might account for the current scarcity of power adapters in the dealer channel. □

*For those who think you can get a MacWEEK mug just for the asking, three words: Get a lamp. For those who know better, the Knife can be found at (415) 243-3544, fax (415) 243-3650, MCI (MactheKnife), Internet (mac_the_knife @macweek.ziff.com), AppleLink (MacWEEK) or CompuServe/ZiffNet/Mac.*



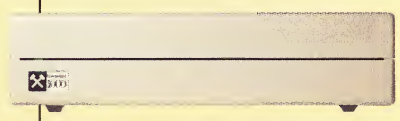


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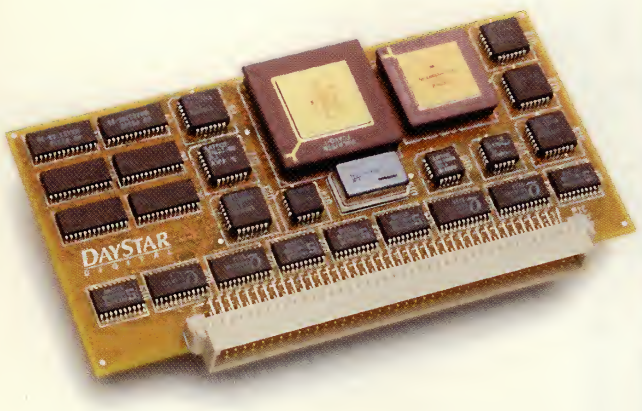
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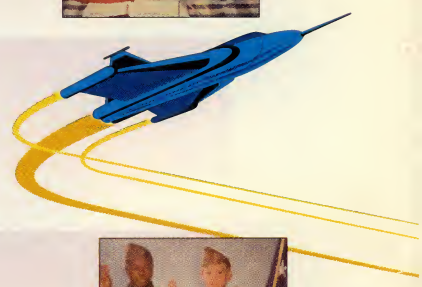
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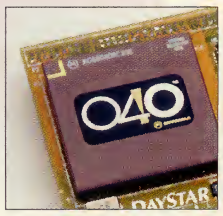
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